

APPENDIX B

INSPECTION, TESTING, AND MAINTENANCE PROCEDURES

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111 - WET PIPE SPRINKLER SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining wet pipe automatic sprinkler systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system annually (including FDC, piping, pipe hangers, sprinkler heads, name plate, head obstructions, and unprotected spaces) to verify that it is in good condition and free of mechanical damage.
- B. Control valves - Visually inspect all control valves of the system at regular intervals as follows.
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with tamper switches - monthly.
 - 3. The inspection shall verify that the valves are:
 - a. In the normal open or closed position
 - b. Properly sealed, locked, or supervised
 - c. Accessible
 - d. Provided with appropriate wrenches
 - e. Free from external leaks

- f. Provided with appropriate identification.
- C. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
- D. Alarm valves
 - 1. Inspect alarm valves monthly. The inspection shall verify the following.
 - a. Gauges indicate that normal supply water pressure is being maintained.
 - b. The valve is free of physical damage.
 - c. All valves are in their appropriate open or closed position.
 - 2. Internally inspect alarm valves and their associated strainers, filters, and restriction orifices at least every 5 years, unless tests indicate a more stringent frequency is required.
- E. FDCs - Inspect monthly. The inspection shall verify the following.
 - 1. The FDCs are visible and accessible.
 - 2. Couplings or swivels are not damaged and rotate smoothly.
 - 3. Plugs or caps are in place and not damaged.
 - 4. If the FDC is plugged, or caps are not in place, inspect the interior of the connection for the following:
 - a. Obstructions
 - b. Whether or not the valve clapper is operational over its full range.
 - 5. Gaskets are in place and in good condition.
 - 6. Identification signs are in place.
 - 7. The check valve is not leaking.
 - 8. The automatic drain valve is in place and operating properly.
 - 9. Components are cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.

4.0 TESTING

- A. Sprinklers - Replace sprinklers when they have been in service for 50 years, or submit representative samples to a recognized testing laboratory acceptable to the AHJ for operational testing. Repeat test procedures thereafter at 10-year intervals.

Exceptions:

- 1. Test fast response sprinklers in service for 20 years. Retest at 10-year intervals.
- 2. At 5-year intervals, test representative samples of solder-type sprinklers, with a temperature classification of extra hazard (325 °F) or greater, that are exposed to semi continuous to continuous maximum allowable ambient temperature conditions.
- B. Conduct quarterly testing of the system alarms by using the inspector's test connection.
- C. Conduct semi annual testing of the system supervisory devices.
- D. Conduct quarterly testing of the main drain connection to verify the availability of water to the system.
- E. Fully close and reopen the system control valve annually.
- F. Annually test any antifreeze solution for the design freeze point.

5.0 MAINTENANCE

- A. Maintain all components of the system in working condition. Repair or replace any components that fail a test or inspection in accordance with the manufacturer's instructions.
- B. Sprinklers
 - 1. Replacement sprinklers shall have the proper characteristics for the application intended. This includes the following:
 - a. Style
 - b. Orifice size and K factor
 - c. Temperature rating
 - d. Coating, if any
 - e. Deflector type
 - f. Design requirements

2. Use only new, listed sprinklers to replace existing sprinklers.
3. Store a supply of spare sprinklers in a cabinet on the premises for replacement purposes. The stock of spare sprinklers shall be proportionally representative of the types and temperature ratings of the system sprinklers. Provide a minimum of two sprinklers of each type and temperature rating. The stock of spare sprinklers shall be as follows:
 - a. For protected facilities having less than 300 sprinklers, at least 6.
 - b. For protected facilities having 300-1,000 sprinklers, at least 12.
 - c. For protected facilities having over 1,000 sprinklers, at least 24.

Provide and keep sprinkler wrench(es) in the cabinet to be used in the removal and installation of sprinklers. Provide a sprinkler wrench for each type of sprinkler installed.

4. Protect sprinklers covering spray coating areas against overspray residue. Protect sprinklers subject to overspray accumulations by using plastic bags having a maximum thickness of .003 in. or by using small paper bags. Replace coverings when deposits or residue accumulate (daily).
5. Annually replace sprinklers and automatic spray nozzles used for protecting commercial-type cooking equipment and ventilation systems.
6. Conduct an obstruction investigation for sprinkler systems and yard main piping whenever any of the following conditions exist:
 - a. Defective intake screens for fire pumps taking suction from open bodies of water.
 - b. Discharge of obstructive material during routine water tests.
 - c. Foreign materials in fire pumps, dry-pipe valves, or check valves.
 - d. Heavy discoloration of water during drain tests or plugging of inspector's test connections.
 - e. Plugging of sprinklers.
 - f. Plugged piping in sprinkler systems dismantled during building alterations.

- g. Failure to flush yard piping or surrounding public mains following new installations or repairs.
- h. A record of broken public mains in the vicinity.
- i. Abnormally frequent false tripping of dry-pipe valves.
- j. A system is returned to service after an extended duration (greater than 1 year).
- k. There is reason to believe that the sprinkler system contains sodium silicate or its derivatives.

C. Control valves

- 1. Annually lubricate the operating stems of outside screw and yoke (OS&Y) valves. Then close and reopen the valve completely to test its operation and distribution of the lubricant. Graphite or graphite in light oil should be used.
 - 2. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.
- D. Clean and repair internal components of alarm valves as necessary, in accordance with the manufacturer's instructions and as deemed necessary by inspection.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the inspector's test connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Hydrostatic test any repaired parts of the system before returning to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25

112 - DRY PIPE SPRINKLER SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining dry pipe sprinkler systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system annually (including FDC, piping, pipe hangers, sprinkler heads, pressure gauges, name plate, head obstructions, and unprotected spaces) to verify that it is in good condition and free of mechanical damage.
- B. Verify weekly the availability of an adequate supply of air or nitrogen capable of repressurizing the system within 30 minutes.
- C. Control valves - Visually inspect all control valves of the system at regular intervals as follows:
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with tamper switches - monthly.
 - 3. The inspection shall verify that the valves are
 - a. In the normal open or closed position
 - b. Properly sealed, locked, or supervised
 - c. Accessible

- d. Provided with appropriate wrenches
 - e. Free from external leaks
 - f. Provided with appropriate identification.
- D. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
- E. FDCs - Inspect monthly. The inspection shall verify the following.
 - 1. The FDCs are visible and accessible.
 - 2. Couplings or swivels are not damaged and rotate smoothly.
 - 3. Plugs or caps are in place and not damaged.
 - 4. If the FDC is plugged, or caps are not in place, inspect the interior of the connection for
 - a. Obstructions
 - b. Whether or not the valve clapper is operational over its full range.
 - 5. Gaskets are in place and in good condition.
 - 6. Identification signs are in place.
 - 7. The check valve is not leaking.
 - 8. The automatic drain valve is in place and operating properly.
 - 9. Components are cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.
- F. Dry-pipe valves
 - 1. Daily, during cold weather, inspect valve enclosure heating equipment for dry-pipe valves subject to freezing to make sure the temperature is at least 40 °F.

Exception: Inspect valve enclosures equipped with low temperature alarms weekly.
 - 2. Inspect gauges weekly.
 - a. The gauge on the supply side of the valve shall indicate that the normal supply water pressure is being maintained.

- b. The gauge on the system side of the valve shall indicate that the proper ratio of air or nitrogen pressure to water supply pressure is being maintained in accordance with the manufacturer's instructions.
- c. The gauge on the quick opening device, if installed, shall indicate the same pressure as the gauge on the system side of the dry pipe valve.

Exception: Inspect systems equipped with low air or nitrogen pressure alarms monthly.

- 3. Inspect the dry-pipe valve weekly to ascertain that
 - a. The valve is free of physical damage.
 - b. The trim valves are in their appropriate open or closed position.
 - c. There is no leakage from the intermediate chamber.
- 4. Inspect the interior of the dry-pipe valve annually when the trip test is conducted. Clean, repair, or replace parts as necessary, in accordance with the manufacturer's instructions.
- 5. Inspect strainers, filters, and restricted orifices internally every 5 years unless tests indicate a more stringent frequency is required.

4.0 TESTING

- A. Sprinklers - When sprinklers have been in service for 50 years, either replace or submit representative samples to a recognized testing laboratory acceptable to the AHJ for operational testing. Repeat test procedures thereafter at 10-year intervals.

Exceptions:

- 1. Test all fast response sprinklers in service for 20 years. Retest them at 10-year intervals.
- 2. At 5-year intervals, test representative samples of solder-type sprinklers, with a temperature classification of extra hazard (325 °F) or greater, that are exposed to semi continuous to continuous maximum allowable ambient temperature conditions.
- B. Fully close and open the system control valve annually.
- C. Dry-pipe valve
 - 1. Test the primary water level quarterly.

2. Test each dry-pipe valve during warm weather in accordance with the manufacturer's instructions.

Exception: For valves protecting property whose nature is such that water can't be discharged for test purposes, conduct the trip test in a manner that will not require discharge into the piping.

3. Every third year and whenever the system is altered, trip test the dry-pipe valve with the control valve wide open and the quick opening device, if installed, in service. In years when full flow testing is not required, trip test each dry-pipe valve with the control valve partially open.
 4. Do not apply grease or other sealing materials to the seating surfaces of the dry-pipe valves.
 5. Test quick opening devices, if installed, semi annually.
 6. Attach a tag or card to the valve showing the date on which the valve was last tripped and the name of the person and organization conducting the test. Maintain separate records of the initial water pressure and valve operating conditions on the premises for comparison with previous results. Maintain records of tripping time.
 7. Test semi annually low air pressure alarms, if provided, in accordance with the manufacturer's instructions.
 8. Test automatic air pressure maintenance devices, if provided, at the time of the annual valve trip test, in accordance with the manufacturer's instructions.
- D. Conduct bimonthly testing of the system alarms by using the alarm bypass connection.
 - E. Conduct annual testing of the main drain connection to verify the availability of water to the system.

5.0 MAINTENANCE

- A. Repair or replace any components that fail a test or inspection in accordance with the manufacturer's instructions.
- B. Sprinklers
 1. Replacement sprinklers shall have the proper characteristics for the application intended. These include
 - a. Style
 - b. Orifice size and K factor

- c. Temperature rating
 - d. Coating, if any
 - e. Deflector type
 - f. Design requirements
2. Use only new, listed sprinklers to replace existing sprinklers.
 3. Store a supply of spare sprinklers in a cabinet on the premises for replacement purposes. The stock of spare sprinklers shall be proportionally representative of the types and temperature ratings of the system sprinklers. Provide a minimum of two sprinklers of each type and temperature rating. Stock the spare sprinklers as follows:
 - a. For protected facilities having less than 300 sprinklers, at least 6.
 - b. For protected facilities having 300-1,000 sprinklers, at least 12.
 - c. For protected facilities having over 1,000 sprinklers, at least 24.

Provide and keep sprinkler wrench(es) in the cabinet to be used in the removal and installation of sprinklers. Provide a sprinkler wrench for each type of sprinkler installed.

4. Protect sprinklers covering spray coating areas against overspray residue. Protect sprinklers subject to overspray accumulations by using plastic bags having a maximum thickness of .003 in. or by using small paper bags. Replace coverings when deposits or residue accumulate.
5. Annually replace sprinklers and automatic spray nozzles used for protecting commercial-type cooking equipment and ventilation systems.
6. Conduct an obstruction investigation for sprinkler systems and yard main piping whenever any of the following conditions exist:
 - a. Defective intake screens for fire pumps taking suction from open bodies of water.
 - b. Discharge of obstructive material during routine water tests.
 - c. Foreign materials in fire pumps, dry-pipe valves, or check valves.

- d. Heavy discoloration of water during drain tests or plugging of inspector's test connections.
- e. Plugging of sprinklers.
- f. Plugged piping in sprinkler systems dismantled during building alterations.
- g. Failure to flush yard piping or surrounding public mains following new installations or repairs.
- h. A record of broken public mains in the vicinity.
- i. Abnormally frequent false tripping of dry-pipe valves.
- j. A system is returned to service after an extended duration (greater than 1 year).
- k. There is reason to believe that the sprinkler system contains sodium silicate or its derivatives.

C. Control valve

- 1. Annually lubricate the operating stems of OS&Y valves. Then completely close and reopen the valve to test its operation and distribution of the lubricant. Graphite or graphite in light oil should be used.
- 2. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

D. Dry-pipe valves

- 1. Locate and repair leaks resulting in pressure losses greater than 10 psi/week.
- 2. During the triannual trip test, thoroughly clean the interior of the dry-pipe valve and replace or repair parts as necessary.
- 3. Drain the low points in dry-pipe sprinkler systems after each operation and before the onset of freezing weather conditions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what

portion of the system is out of service.

- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the alarm bypass connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Hydrostatic and flush test any repaired parts of the system before returning to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25

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113 - DELUGE SPRINKLER SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining deluge sprinkler systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system annually (including FDC, piping, pipe hangers, sprinkler heads, pressure gauges, name plate, head obstructions, and unprotected spaces) to verify that it is in good condition and free of mechanical damage.
- B. Control valves - Visually inspect all control valves of the system at regular intervals as follows:
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with tamper switches - monthly.
 - 3. The inspection shall verify that the valves are
 - a. In the normal open or closed position
 - b. Properly sealed, locked, or supervised
 - c. Accessible
 - d. Provided with appropriate wrenches
 - e. Free from external leaks

- f. Provided with appropriate identification.
- C. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
- D. FDCs - Inspect monthly. The inspection shall verify the following.
- 1. The FDCs are visible and accessible.
 - 2. Couplings or swivels are not damaged and rotate smoothly.
 - 3. Plugs or caps are in place and not damaged.
 - 4. If the FDC is plugged, or caps are not in place, inspect the interior of the connection for
 - a. Obstructions
 - b. Whether or not the valve clapper is operational over its full range.
 - 5. Gaskets are in place and in good condition.
 - 6. Identification signs are in place.
 - 7. The check valve is not leaking.
 - 8. The automatic drain valve is in place and operating properly.
 - 9. Components are cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.
- E. Deluge valves
- 1. Daily, during cold weather, visually inspect valve enclosure heating equipment for the deluge valves' ability to maintain a minimum temperature of at least 40 °F.

Exception: Inspect valve enclosures equipped with low temperature alarms weekly.
 - 2. Inspect gauges weekly. The gauge on the supply side of the valve should indicate that the normal supply water pressure is being maintained.

Exception: The gauge monitoring the detection system pressure, if provided, shall be inspected monthly to indicate that normal pressure is being maintained.

3. Inspect the deluge valve weekly to ascertain that
 - a. The valve is free from physical damage
 - b. All trim valves are in their appropriate open or closed position
 - c. There is no leakage from the valve seat
 - d. Electrical components are in service.
4. Inspect the interior of the deluge valve annually when the trip test is conducted. Clean, repair, or replace parts as necessary in accordance with the manufacturer's instructions.

Exception: Internal inspection of valves that can be reset without removal of a faceplate shall be conducted every 5 years.
5. Internally inspect strainers, filters, and restricted orifices every 5 years, unless tests indicate a more stringent frequency is required.

4.0 TESTING

- A. Sprinklers - Replace sprinklers when they have been in service for 50 years, or submit representative samples to a recognized testing laboratory acceptable to the AHJ for operational testing. Repeat test procedures thereafter at 10-year intervals.

Exceptions:

1. Test fast response sprinklers in service for 20 years. Retest at 10-year intervals.
 2. At 5-year intervals, test representative samples of solder-type sprinklers, with a temperature classification of extra hazard (325 °F) or greater, that are exposed to semi continuous to continuous maximum allowable ambient temperature conditions.
- B. Fully close and reopen the control valves annually.
 - C. Conduct bimonthly testing of the system alarms by using the alarm bypass connection.
 - D. Conduct annual testing of the main drain connection to verify the availability of water to the deluge valves.

E. Deluge valves

1. Trip test each deluge valve annually in warm weather in accordance with the manufacturer's instructions.
 - a. Observe the water discharge patterns from all open sprinklers or spray nozzles to ensure that patterns are not impeded by plugging. Also, observe the sprinklers to ensure that they are properly positioned and that obstructions do not prevent discharge patterns from effectively wetting surfaces to be protected. When obstructions occur, clean the piping, sprinklers, or nozzles and retest the system.
 - b. Record pressure readings at the hydraulically most remote nozzle or sprinkler to ensure that the waterflow has not been impeded by partially closed valves, plugged strainers, or piping. Record a second pressure reading at the deluge valve to ensure that the water supply is adequate. Compare these readings to the hydraulic design pressures to ensure that the original system design is met and that the water supply is adequate to meet the design requirements.

Exception: When the hydraulically most remote nozzle or sprinkler is inaccessible, it is permissible to visually check nozzles or sprinklers without taking a pressure reading on the most remote nozzle or sprinkler. However, when the reading taken at the riser indicates that the water supply has deteriorated, place a gauge on the hydraulically most remote nozzle or sprinkler and compare the result with the required design pressure.

- c. Multiple systems - Simultaneously test the maximum number of systems expected to operate in case of fire to check the adequacy of the water supply.

Exception: When the nature of the protected property is such that water cannot be discharged unless protected equipment is shut down (e.g. energized electrical equipment), conduct a full flow system test at the next scheduled shutdown. In all cases, the test frequency shall not exceed 3 years.

2. Operate manual actuation devices at least annually.
3. After the trip test, return the system to service in accordance with the manufacturer's instructions.
4. Do not apply grease or other sealing materials to the seating surfaces of the valve.
5. Attach a tag or card to the valve showing the date on which the

valve was last tripped and the name and organization conducting the test. Maintain records of operating conditions on the premises for comparing with previous results. Also maintain records of tripping time.

D. Deluge system activation fire detection subsystem.

1. Test each initiation device (manual activation stations and fire detectors) in accordance with manufacturer's requirements semi annually.
2. Test duration of battery backup power supply on an annual basis.
3. Conduct bimonthly testing of system output, system activation signals, and alarm, supervisory, and trouble conditions.

5.0 MAINTENANCE

A. Maintain the system in operating condition. Repair or replace any components failing a test or inspection in accordance with the manufacturer's instructions.

B. Sprinklers

1. Replacement sprinklers shall have the proper characteristics for the application intended. These include
 - a. Style
 - b. Orifice size and K factor
 - c. Temperature rating
 - d. Coating, if any
 - e. Deflector type
 - f. Design requirements.
2. Use only new, listed sprinklers to replace existing sprinklers.
3. Store a supply of spare sprinklers in a cabinet on the premises for replacement purposes. The stock of spare sprinklers shall be proportionally representative of the types and temperature ratings of the system sprinklers. Provide a minimum of two sprinklers of each type and temperature rating. Stock spare sprinklers as follows:
 - a. For protected facilities having less than 300 sprinklers, at least 6.

- b. For protected facilities having 300-1,000 sprinklers, at least 12.
- c. For protected facilities having over 1,000 sprinklers, at least 24.

Provide and keep sprinkler wrench(es) in the cabinet to be used in the removal and installation of sprinklers. Provide a sprinkler wrench for each type of sprinkler installed.

- 4. Protect sprinklers covering spray coating areas against overspray residue. Protect sprinklers subject to overspray accumulations by using plastic bags having a maximum thickness of .003 in. or by using small paper bags. Replace coverings when deposits or residue accumulate (daily).
- 5. Annually replace sprinklers and automatic spray nozzles used for protecting commercial-type cooking equipment and ventilation systems.
- 6. Conduct an obstruction investigation for sprinkler systems and yard main piping whenever any of the following conditions exist:
 - a. Defective intake screens for fire pumps taking suction from open bodies of water
 - b. Discharge of obstructive material during routine water tests
 - c. Foreign materials in fire pumps, dry-pipe valves, or check valves
 - d. Heavy discoloration of water during drain tests or plugging of inspector's test connections
 - e. Plugging of sprinklers
 - f. Plugged piping in sprinkler systems dismantled during building alterations
 - g. Failure to flush yard piping or surrounding public mains following new installations or repairs
 - h. A record of broken public mains in the vicinity
 - i. Abnormally frequent false tripping of dry-pipe valves
 - j. A system is returned to service after an extended duration (greater than 1 year)
 - k. There is reason to believe that the sprinkler system contains sodium silicate or its derivatives.

C. Control valve

1. Annually lubricate the operating stems of OS&Y valves. Then, completely close and reopen the valve to test its operation and distribution of the lubricant. Graphite or graphite in light oil should be used.
2. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

D. Deluge valves

1. During the annual trip test, thoroughly clean the interior of the deluge valve, and replace or repair parts as necessary.
2. Drain the low points in deluge systems after each operation and before the onset of freezing weather conditions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the alarm bypass connection to verify that the

system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.

- D. Hydrostatic and flush test any repaired parts of the system before returning to service.
- E. Test the activation system to verify that all of the fire detectors are in place and will operate the deluge valve.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25
- E. NFPA 72
- F. NFPA 72E

114 - PRE-ACTION SPRINKLER SYSTEM

(WITH SUPERVISORY AIR PRESSURE)

1.0 PURPOSE

- A. This procedure establishes a method for inspecting, testing, and maintaining pre-action sprinkler systems with supervisory air pressure.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system annually (including FDC, piping, pipe hangers, sprinkler heads, name plate, head obstructions, and unprotected spaces) to verify that it is in good condition and free of mechanical damage.
- B. Control valves - Visually inspect all control valves of the system at regular intervals as follows.
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with tamper switches - monthly.
 - 3. The inspection shall verify that the valves are
 - a. In the normal open or closed position
 - b. Properly sealed, locked, or supervised
 - c. Accessible

- d. Provided with appropriate wrenches
 - e. Free from external leaks
 - f. Provided with appropriate identification.
- C. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
- D. FDC - Inspect monthly. The inspection shall verify the following.
 - 1. The FDCs are visible and accessible.
 - 2. Couplings or swivels are not damaged and rotate smoothly.
 - 3. Plugs or caps are in place and not damaged.
 - 4. If the FDC is plugged, or caps are not in place, inspect the interior of the connection for
 - a. Obstructions
 - b. Whether or not the valve clapper is operational over its full range.
 - 5. Gaskets are in place and in good condition.
 - 6. Identification signs are in place.
 - 7. The check valve is not leaking.
 - 8. The automatic drain valve is in place and operating properly.
 - 9. Clean, repair, or replace components as necessary in accordance with the manufacturer's instructions.
- E. Deluge valve
 - 1. Daily, during cold weather, visually inspect valve enclosure heating equipment for deluge valves subject to freezing to make sure that the temperature is at least 40 °F.

Exception: Inspect valve enclosures equipped with low temperature alarms weekly.
 - 2. Visually inspect gauges weekly. The gauge on the supply side of the valve shall indicate that the normal supply water pressure is being maintained.

Exceptions:

- a. Monthly, test the gauge monitoring the pre-action system supervisory air pressure, if provided, to indicate that the normal pressure is being maintained.
 - b. Monthly, test the gauge monitoring the detection system pressure, if provided, to indicate that normal pressure is being maintained.
 - c. Semiannually, test gauges that are connected to systems, which are monitored by an approved fire alarm system.
3. Inspect the deluge valve weekly to ascertain that
 - a. The valve is free from physical damage
 - b. All trim valves are in their appropriate open or closed position
 - c. There is no leakage from the valve seat
 - d. Electrical components are in service.
 4. Inspect the interior of the deluge valve annually when the trip test is conducted. Clean, repair, or replace parts as necessary in accordance with the manufacturer's instructions.
 5. Inspect strainers, filters, and restricted orifices internally every 5 years unless tests indicate a more stringent frequency is required.

4.0 TESTING

- A. Sprinklers - Replace sprinklers when they have been in service for 50 years, or submit representative samples to a recognized testing laboratory acceptable to the AHJ for operational testing. Repeat test procedures thereafter at 10-year intervals.

Exceptions:

1. Test fast response sprinklers in service for 20 years. Retest at 10-year intervals.
 2. At 5-year intervals, test representative samples of solder-type sprinklers, with a temperature classification of extra hazard (325 °F) or greater, that are exposed to semi continuous to continuous maximum allowable ambient temperature conditions.
- B. Control valves - Fully close and reopen the control valves annually.
 - C. Conduct bi monthly testing of the system alarms by using the alarm

bypass connection.

- D. Conduct annual testing of the main drain connection to verify the availability of water to the system.

- E. Deluge valve

1. Quarterly, test the priming water level in supervised pre-action systems for compliance with the manufacturer's instructions.
2. Annually, trip test each deluge valve in warm weather in accordance with the manufacturer's instructions.

Exception: For valves protecting property whose nature is such that water cannot be discharged into the piping for test purposes, conduct the trip test in a manner that will not require discharge into the piping area.

3. Operate manual actuation devices at least semiannually.
4. After the trip test, return the system to service in accordance with the manufacturer's instructions.
5. Do not apply grease or other sealing materials to the seating surfaces of the valve.
6. Attach a tag or card to the valve showing the date on which the valve was last tripped and the name and organization conducting the test. Maintain records of operating conditions on the premises for comparison with previous results. Also, maintain records of tripping time.
7. Semiannually, test low air pressure alarms, if provided, in accordance with the manufacturer's instructions.
8. Test automatic air pressure maintenance devices, if provided, at the time of the annual pre-action or deluge valve trip test, in accordance with the manufacturer's instructions.

- F. Pre-action system activation fire detection subsystem.

1. Semiannually, test each initiation device (manual activation stations and fire detectors) in accordance with the manufacturer's requirements.
2. Test duration of battery backup power supply on an annual basis.
3. Conduct bimonthly testing of system output, system activation signals, and alarm, supervisory, and trouble conditions.

5.0 MAINTENANCE

- A. Maintain the system in operating condition. Replace or repair any components failing a test or inspection in accordance with the manufacturer's instructions.
- B. Sprinklers
 - 1. Replacement sprinklers shall have the proper characteristics for the application intended. This includes
 - a. Style
 - b. Orifice size and K factor
 - c. Temperature rating
 - d. Coating, if any
 - e. Deflector type
 - f. Design requirements.
 - 2. Use only new, listed sprinklers to replace existing sprinklers.
 - 3. Store a supply of spare sprinklers in a cabinet on the premises for replacement purposes. The stock of spare sprinklers shall be proportionally representative of the types and temperature ratings of the system sprinklers. Provide a minimum of two sprinklers of each type and temperature rating. Stock spare sprinklers as follows:
 - a. For protected facilities having less than 300 sprinklers, at least 6.
 - b. For protected facilities having 300-1,000 sprinklers, at least 12.
 - c. For protected facilities having over 1,000 sprinklers, at least 24.

Provide and keep sprinkler wrench(es) in the cabinet to be used in the removal and installation of sprinklers. Provide a sprinkler wrench for each type of sprinkler installed.

- 4. Protect sprinklers covering spray coating areas against overspray residue. Protect sprinklers subject to overspray accumulations by using plastic bags having a maximum thickness of .003 in. or by using small paper bags. Replace coverings when deposits or residue accumulate (daily).
- 5. Annually, replace sprinklers and automatic spray nozzles used for protecting commercial-type cooking equipment and

ventilation systems.

6. Conduct an obstruction investigation for sprinkler systems and yard main piping whenever any of the following conditions exist:
 - a. Defective intake screens for fire pumps taking suction from open bodies of water
 - b. Discharge of obstructive material during routine water tests
 - c. Foreign materials in fire pumps, dry-pipe valves, or check valves
 - d. Heavy discoloration of water during drain tests or plugging of inspector's test connections
 - e. Plugging of sprinklers
 - f. Plugged piping in sprinkler systems dismantled during building alterations
 - g. Failure to flush yard piping or surrounding public mains following new installations or repairs
 - h. A record of broken public mains in the vicinity
 - i. Abnormally frequent false tripping of dry-pipe valves
 - j. A system is returned to service after an extended duration (greater than 1 year)
 - k. There is reason to believe that the sprinkler system contains sodium silicate or its derivatives.

C. Control valves

1. Annually, lubricate the operating stems of OS&Y valves. Then close and reopen the valve completely to test its operation and distribution of the lubricant. Graphite or graphite in light oil should be used.
2. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

D. Deluge valves

1. Locate and repair leaks that cause drops in supervisory pressure and create electrical malfunctions, both of which cause alarms to sound.
2. During the annual trip test, thoroughly clean the interior of

the deluge valve and replace or repair parts as necessary.

3. Drain low points in pre-action systems after each operation and before the onset of freezing weather conditions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the alarm bypass connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Hydrostatic and flush test any repaired parts of the system before returning to service.
- E. Test the activation system to verify that all of the fire detectors are in place and will operate the deluge valve.

7.0 RECORDS

Maintain records showing the system inspection, testing, and maintenance for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25
- E. NFPA 72
- F. NFPA 72E

115 - PRE-ACTION SPRINKLER SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining pre-action sprinkler systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system annually (including FDC, piping, pipe hangers, sprinkler heads, pressure gauges, name plate, head obstructions, and unprotected spaces) to verify that it is in good condition and free from mechanical damage.
- B. Control valves - Visually inspect all control valves of the system at regular intervals as follows.
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with tamper switches - monthly.
 - 3. The inspection shall verify that the valves are
 - a. In the normal open or closed position
 - b. Properly sealed, locked, or supervised
 - c. Accessible
 - d. Provided with appropriate wrenches
 - e. Free from external leaks

- f. Provided with appropriate identification.
- C. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
- D. FDC - Inspect monthly. The inspection shall verify the following.
- 1. The FDCs are visible and accessible.
 - 2. Couplings or swivels are not damaged and rotate smoothly.
 - 3. Plugs or caps are in place and not damaged.
 - 4. If the FDC is plugged, or caps are not in place, inspect the interior of the connection for
 - a. Obstructions
 - b. Whether or not the valve clapper is operational over its full range.
 - 5. Gaskets are in place and in good condition.
 - 6. Identification signs are in place.
 - 7. The check valve is not leaking.
 - 8. The automatic drain valve is in place and operating properly.
 - 9. Components are cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.
- E. Deluge valve
- 1. Daily, during cold weather, visually inspect valve enclosure heating equipment for deluge valves subject to freezing. Make sure that the temperature is at least 40 °F.

Exception: Valve enclosures equipped with low temperature alarms shall be inspected weekly.
 - 2. Visually inspect gauges weekly. The gauge on the supply side of the valve shall indicate that the normal supply water pressure is being maintained.

Exception: The gauge monitoring the detection system pressure, if provided, shall be tested monthly to indicate that normal pressure is being maintained.

3. Weekly, inspect the deluge valve to ascertain that
 - a. The valve is free from physical damage
 - b. All trim valves are in their appropriate open or closed position
 - c. There is no leakage from the valve seat
 - d. Electrical components are in service.
4. Annually, inspect the interior of the deluge valve when the trip test is conducted. Clean, repair, or replace parts as necessary in accordance with the manufacturer's instructions.

Exception: Internal inspection of valves that can be reset without removal of a faceplate shall be conducted every 5 years.

5. Internally inspect strainers, filters, and restricted orifices every 5 years unless tests indicate a more stringent frequency is required.

4.0 TESTING

- A. Sprinklers - Replace sprinklers that have been in service for 50 years, or submit representative samples to a recognized testing laboratory acceptable to the AHJ for operational testing. Thereafter, repeat test procedures at 10-year intervals.

Exceptions:

1. Test any fast response sprinklers in service for 20 years. Retest them at 10-year intervals.
 2. At 5-year intervals, test representative samples of solder-type sprinklers, with a temperature classification of extra hazard (325 °F) or greater, that are exposed to semi continuous to continuous maximum allowable ambient temperature conditions.
- B. Fully close and reopen the control valves annually.
 - C. Conduct bimonthly testing of the system alarms by using the alarm bypass connection.
 - D. Conduct annual testing of the main drain connection to verify the availability of water to the system.
 - E. Deluge valve
 1. Annually, trip test each deluge valve in warm weather in accordance with the manufacturer's instructions.

Exception: For valves protecting property whose nature is such that water cannot be discharged into the piping for test purposes, conduct the trip test in a manner that will not require discharge into the piping.

2. Operate manual actuation devices at least annually.
3. After the trip test, return the system to service in accordance with the manufacturer's instructions.
4. Do not apply grease or other sealing materials to the seating surfaces of the valve.
5. Attach to the valve a tag or card showing the date on which the valve was last tripped and the name and organization conducting the test. Maintain records of operating conditions on the premises for comparing with previous results. Also maintain records of tripping time.

F. Pre-action system activation subsystem.

1. Semiannually, test each initiation device (manual activation stations and fire detectors) in accordance with manufacturer's requirements.
2. Test duration of battery backup power supply on an annual basis.
3. Conduct bimonthly testing of system output, system activation signals, and alarm, supervisory, and trouble conditions.

5.0 MAINTENANCE

A. Maintain the system in operating condition. Repair or replace any components that fail a test or inspection in accordance with the manufacturer's instructions.

B. Sprinklers

1. Replacement sprinklers shall have the proper characteristics for the application intended. This includes
 - a. Style
 - b. Orifice size and K factor
 - c. Temperature rating
 - d. Coating, if any
 - e. Deflector type

- f. Design requirements.
2. Use only new, listed sprinklers to replace existing sprinklers.
 3. Store a supply of spare sprinklers in a cabinet on the premises for replacement purposes. The stock of spare sprinklers shall be proportionally representative of the types and temperature ratings of the system sprinklers. Provide a minimum of two sprinklers of each type and temperature rating. The stock of spare sprinklers shall be as follows:
 - a. For protected facilities having less than 300 sprinklers, at least 6
 - b. For protected facilities having 300-1,000 sprinklers, at least 12
 - c. For protected facilities having over 1,000 sprinklers, at least 24.

Provide a sprinkler wrench(es) and keep it (them) in the cabinet, to be used in the removal and installation of sprinklers. Provide a sprinkler wrench for each type of sprinkler installed.

4. Protect sprinklers covering spray coating areas against overspray residue. Protect sprinklers subject to overspray accumulations by using plastic bags having a maximum thickness of .003 in. or by using small paper bags. Replace coverings daily when deposits or residue accumulate.
5. Annually replace sprinklers and automatic spray nozzles used for protecting commercial-type cooking equipment and ventilation systems.
6. Conduct an obstruction investigation for sprinkler systems and yard main piping whenever any of the following conditions exist:
 - a. Defective intake screens for fire pumps taking suction from open bodies of water
 - b. Discharge of obstructive material during routine water tests
 - c. Foreign materials in fire pumps, dry-pipe valves, or check valves
 - d. Heavy discoloration of water during drain tests or plugging of inspector's test connections
 - e. Plugging of sprinklers

- f. Plugged piping in sprinkler systems dismantled during building alterations
- g. Failure to flush yard piping or surrounding public mains following new installations or repairs
- h. A record of broken public mains in the vicinity
- i. Abnormally frequent false tripping of dry-pipe valves
- j. A system is returned to service after an extended duration (greater than 1 year)
- k. There is reason to believe that the sprinkler system contains sodium silicate or its derivatives.

C. Control valve

- 1. Annually lubricate the operating stems of OS&Y valves. Then completely close and reopen the valve to test its operation and distribution of the lubricant. Use graphite or graphite in light oil.
- 2. Clean, repair, or replace internal components as necessary, in accordance with the manufacturer's instructions.

D. Deluge valve

- 1. During the annual trip test, Thoroughly clean the interior of the pre-action of deluge valve and replace or repair parts as necessary.
- 2. Drain low points in pre-action systems after each operation and before the onset of freezing weather conditions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.

- E. Begin repair operations within 8 hours or A and B or C or D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the alarm bypass connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Hydrostatic and flush test any repaired parts of the system before returning to service.
- E. Test the activation system to verify that all of the fire detectors are in place and will operate the deluge valve.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 25
- E. NFPA 72
- F. NFPA 72E

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116 - FOAM-WATER EXTINGUISHING SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining foam-water extinguishing systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system quarterly (including all system piping, fittings, hangers, discharge devices, pressure gauges, name plates, valves, proportioners, etc.).
- B. Control valves - Visually inspect all control valves of the system at regular intervals as follows.
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with tamper switches - monthly.
 - 3. The inspection shall verify that the valves are
 - a. In the normal open or closed position
 - b. Properly sealed, locked, or supervised
 - c. Accessible
 - d. Provided with appropriate wrenches
 - e. Free from external leaks

- f. Provided with appropriate identification.
- C. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary, in accordance with the manufacturer's instructions.
 - D. Backflow preventers - Inspect and maintain, in accordance with the manufacturer's instructions, specialized backflow prevention devices, such as the following: (1) reduced pressure principle backflow preventers, (2) double check valve assemblies, (3) backflow preventers with intermediate atmospheric vents, and (4) atmospheric vacuum breakers. In addition, inspect OS&Y isolation valves weekly to ensure that they are in the normal positions. Monthly, inspect valves secured with locks or that are electrically supervised. Inspect reduced pressure backflow preventers weekly to ensure that the differential sensing valve relief port is not continuously discharging.
 - E. FDCs - Inspect monthly. The inspection shall verify the following.
 - 1. The FDCs are visible and accessible.
 - 2. Couplings or swivels are not damaged and rotate smoothly.
 - 3. Plugs or caps are in place and not damaged.
 - 4. If the FDC is plugged, or caps are not in place, inspect the interior of the connection for
 - a. Obstructions
 - b. Whether or not the valve clapper is operational over its full range.
 - 5. Gaskets are in place and in good condition.
 - 6. Identification signs are in place.
 - 7. The check valve is not leaking.
 - 8. The automatic drain valve is in place and operating properly.
 - 9. Components are cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.
 - F. Deluge valve
 - 1. Daily, during cold weather, visually inspect valve enclosure heating equipment for deluge valves subject to freezing to make sure that the temperature is at least 40 °F.

Exception: Weekly, inspect valve enclosures equipped with low temperature alarms.

2. Visually inspect gauges weekly. The gauge on the supply side of the valve should indicate that the normal supply water pressure is being maintained.

Exception: Monthly, inspect the gauge monitoring the detection system pressure, if provided, to verify that normal pressure is being maintained.

3. Inspect the deluge valve weekly to ascertain that
 - a. The valve is free from physical damage
 - b. All trim valves are in their appropriate open or closed position
 - c. There is no leakage from the valve seat
 - d. Electrical components are in service.

4. Annually, inspect the interior of the deluge valve when the trip test is conducted. Clean, repair, or replace parts as necessary in accordance with the manufacturer's instructions.

Exception: Every 5 years, conduct an internal inspection of valves that can be reset without removal of a faceplate.

5. Internally inspect strainers, filters, and restricted orifices every 5 years unless tests indicate a more stringent frequency is required.

- G. Foam-water discharge devices - Visually inspect monthly to ensure that they are in place, continue to be aimed or pointed in the direction intended in the system design, and are free from external loading and corrosion. Where caps and plugs are required, the inspection should confirm they are in place and free to operate as intended.

If the devices are misaligned, adjust them (aimed) by visual means, and check the discharge patterns at the next scheduled flow test.

Discharge devices are listed and approved with particular foam concentrates. Inspect to verify that unlisted combinations of discharge devices and foam concentrate have not been substituted.

- H. Strainers - Flush the mainline strainer (basket or screen) until clear after each operation or flow test. Remove, clean, and inspect individual water spray nozzle strainers after each operation or flow test. Inspect and clean all strainers in accordance with the manufacturer's instructions. Replace or repair damaged or corroded

parts.

- I. Drainage - Monthly, visually inspect the area beneath and surrounding a foam-water spray system to determine that drainage facilities, such as trapped sumps and drainage trenches, are not blocked, and retention embankments or dikes are in good repair.
- J. Inspect the concentrate tank monthly to verify that there is an adequate quantity of foam concentrate to satisfy the system's original design requirements.
- K. Semi annually, visually inspect all fire detectors in the system's fire detection subsystem to verify that the detector is in good physical condition and that there have been no changes that would affect its performance. Follow the guidelines in Procedure 151 for further maintenance and inspection.

4.0 TESTING

- A. Sprinklers - Replace sprinklers after 50 years of service or submit representative samples to a recognized testing laboratory acceptable to the AHJ for operational testing. Repeat test procedures thereafter at 10-year intervals.

Exceptions:

- 1. Test fast response sprinklers that have been in service for 20 years. Retest at 10-year intervals.
 - 2. At 5-year intervals, test representative samples of solder-type sprinklers, with a temperature classification of extra hazard (325 °F) or greater, that are exposed to semi continuous to continuous maximum allowable ambient temperature conditions.
- B. Preparation - Take care to prevent foam-water damage by verifying that there is adequate drainage. Provide protection for any devices that may be damaged during tests by the discharge of the system or run-off.
 - C. Fully close and reopen system control valves annually.
 - D. Operation performance test - Conduct operation tests annually to ensure that the foam-water system(s) will respond as designed, both automatically and manually. The test procedures simulate, wherever possible, anticipated emergency events so the response of the foam-water system(s) can be evaluated.

Exception: Where discharge from the system discharge devices will create a hazardous condition or conflict with local requirements, an approved alternate method to achieve full flow conditions is acceptable.

1. Response Time: Under test conditions, operate automatic detection systems, when exposed to a test source, within the requirements of NFPA 72E. This time shall be recorded.
2. Discharge Time: The system and foam-water supplies are designed to discharge effective foam-water from all nozzles within 30 seconds following operation of the detection system. These times shall be recorded.

Exception: Closed head foam-water sprinkler systems.

3. Discharge Patterns: Observe the discharge patterns from all of the discharge devices to ensure that patterns are not impeded by plugging of the discharge devices, discharge devices are properly positioned, and obstructions do not prevent discharge patterns from effectively covering surfaces to be protected. When internal obstructions occur, clean the piping and discharge devices and retest the system. These discharge devices may be of different orifice sizes and types. Some discharge devices may be more subject to internal obstruction than others.

Exception: Closed head foam-water sprinkler systems.

4. Pressure Readings: Record pressure readings at the highest, most remote discharge device to ensure solution flow has not been impeded by partially closed valves or by plugged strainers or piping. Record a second pressure reading at the main control valve to ensure the water supply is adequate. Compare these readings to the hydraulic design pressures and volumes to ensure the original system design is met and the water supply is adequate to meet the design requirements. Loss of pressure of more than 10% should be immediately investigated to determine its cause.
5. Multiple System: Simultaneously, test the maximum number of systems expected to operate in case of fire to check the adequacy of the water supply and concentrate pump.
6. Manual activation: Test devices at least annually.
7. Concentration Testing: During the full flow foam test, take a foam sample. This sample should then be placed in a 1 pint container; labeled with the name of the person to contact, the system location, address, telephone number, and date the sample was taken; and sent to the manufacturer for qualitative testing. Concentration should be within $\pm 10\%$ of the acceptance test results, but in no case more than 10% below minimum design.
8. After the full flow test, return the foam-water systems to service, and replenish the foam concentrate tank to the required level.

- C. Test waterflow alarms bimonthly by opening the alarm bypass connection.

Exception: There is no inspector's test connection on a deluge foam-water sprinkler system.

- D. Annually, trip test the deluge valve. Conduct the tests without discharging foam from the system or diluting the foam concentrate supply.
- E. Conduct annual testing of the main drain connection to verify the availability of water to the system.
- F. Test the fire detection subsystem for proper operation under the procedures and frequencies stated in Procedure 151.
- G. Semi annually, drain approximately 5 gal of foam liquid from the bottom of the concentrate tank through the tank drain. Let it stand for several hours so that any scale (rust) will settle to the bottom of the container. Return the sample to the tank top by pouring it through a strainer. By this method, the quantity of scale can be determined, and one can decide if the tank should be cleaned.

5.0 MAINTENANCE

- A. Follow the manufacturer's maintenance recommendations for all components of the foam-water extinguishing system.
- B. Sprinklers
 - 1. Replacement sprinklers must have the proper characteristics for the application intended. These include the following:
 - a. Style
 - b. Orifice size and K factor
 - c. Temperature rating
 - d. Coating, if any
 - e. Deflector type
 - f. Design requirements.
 - 2. Use only new, listed sprinklers to replace existing sprinklers.

3. Store a supply of spare sprinklers in a cabinet on the premises for replacement purposes. The stock of spare sprinklers shall be proportionally representative of the types and temperature ratings of the system sprinklers. Provide a minimum of two sprinklers of each type and temperature rating. The stock of spare sprinklers shall be as follows:
 - a. For protected facilities having less than 300 sprinklers, at least 6.
 - b. For protected facilities having 300-1,000 sprinklers, at least 12.
 - c. For protected facilities having over 1,000 sprinklers, at least 24.

Provide and keep sprinkler wrench(es) in the cabinet to be used in the removal and installation of sprinklers. Provide a sprinkler wrench for each type of sprinkler installed.

4. Protect sprinklers covering spray coating areas against overspray residue. Protect sprinklers subject to overspray accumulations by using plastic bags having a maximum thickness of .003 in. or by using small paper bags. Replace coverings when deposits or residue accumulate (daily).
5. Annually, replace sprinklers and automatic spray nozzles used for protecting commercial-type cooking equipment and ventilation systems.
6. Conduct an obstruction investigation for sprinkler systems and yard main piping whenever any of the following conditions exist:
 - a. Defective intake screens for fire pumps taking suction from open bodies of water.
 - b. Discharge of obstructive material during routine water tests.
 - c. Foreign materials in fire pumps, dry-pipe valves, or check valves.
 - d. Heavy discoloration of water during drain tests or plugging of inspector's test connections.
 - e. Plugging of sprinklers.
 - f. Plugged piping in sprinkler systems dismantled during building alterations.
 - g. Failure to flush yard piping or surrounding public mains following new installations or repairs.

- h. A record of broken public mains in the vicinity.
- i. Abnormally frequent false tripping of dry-pipe valves.
- j. A system is returned to service after an extended duration (greater than 1 year).
- k. There is reason to believe that the sprinkler system contains sodium silicate or its derivatives.

C. Control valve

- 1. Annually, lubricate the operating stems of OS&Y valves using graphite or graphite in light oil. Then, completely close and reopen the valve to test its operation and distribution of the lubricant.
- 2. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

D. Deluge valve

- 1. During the annual trip test, thoroughly clean the interior of the deluge valve and replace or repair parts as necessary.
- 2. Drain low points in systems after each operation and before the onset of freezing weather conditions.

6.0 PROPORTIONER EQUIPMENT INSPECTION, TESTING, AND MAINTENANCE

- A. Verify valve position monthly (open or closed) in accordance with specified operating requirements.
- B. Vacuum vents are to be serviced annually as follows.
 - 1. Remove vent from expansion dome. While vent is removed, make certain that the opening is not blocked and that dirt or other foreign objects do not enter the tank.
 - 2. Remove vent bonnet and lift out vacuum valve and pressure valve.
 - 3. Flush vent body internally and wash vacuum valve and pressure valve thoroughly. Water should be adequate for normal cleaning. Make sure the screen is not clogged and avoid the use of any hard, pointed objects to clear the screen.
 - 4. If liquid has become excessively gummy or solidified, soak vent body and parts in hot, soapy water.
 - 5. Turn vent body upside down and drain thoroughly. Dry parts by

placing them in a warm and dry area or by using an air hose.

6. Spray parts with a light Teflon¹ coating and reassemble vent. Avoid the use of any type of oil for lubrication purposes as oil is harmful to the foam liquid.
7. Replace vent bonnet and slowly turn vent upside down a few times to ensure proper freedom of the moveable parts.
8. Attach vent to the liquid storage tank expansion dome.

C. Standard pressure proportioner

1. Inspection

This is a pressure vessel. To prevent injury, remove pressure before monthly inspection. Inspect as follows:

- a. Ball drip valves (automatic drains) are free and opened
- b. External corrosion on foam concentrate storage tanks is not present.

2. Testing

- a. Operation test will verify whether or not the proportioner is functioning properly.

3. Maintenance

- a. Ball drip (automatic type) drain valves be disassembled, cleaned, and reassembled every 5 years.
- b. Inspect the foam liquid tank for internal and external corrosion and hydrostatically test to the specified working pressure every 10 years.
- c. Drain the foam liquid storage tank of foam liquid and flush every 10 years. Foam liquid may be salvaged and reused.

D. Bladder Tank Proportioners

1. Inspection

Inspect monthly as follows:

- a. Water control valves to the foam concentrate tank are open.

¹Teflon is a trademark of E.I. Du Pont de Nemours Company.

- b. No external corrosion is present on the foam concentrate storage tanks.

2. Testing

- a. The operation test will verify whether or not the proportioner is operating properly.

3. Maintenance

- a. Remove and clean the sight glass, when provided, every 10 years.
- b. Hydrostatically test the foam concentrate tank to the specified working pressure every 10 years. Consult the manufacturer for appropriate procedures.

E. Line proportioner

1. Inspection

Inspect monthly as follows.

- a. Flush mainline strainer (basket or screen) until clear after each operation or flow test. Inspect and clean all strainers in accordance with the manufacturer's instructions. Replace or repair damaged or corroded parts.
- b. Pressure vacuum vent operates freely.
- c. No external corrosion is present on the foam concentrate storage tank.

2. Testing

- a. The operation test will verify whether or not the proportioner is functioning properly.

3. Maintenance

- a. Inspect the foam concentrate tank for internal corrosion every 10 years. Inspect pickup pipes inside the tank for corrosion, separation, or plugging every 10 years.
- b. Drain and flush the foam concentrate tank every 10 years. Foam concentrate may be salvaged and reused.

F. Standard balanced pressure proportioner

1. Inspection

Inspect monthly as follows.

- a. Flush mainline strainer (basket or screen) until clear after each operation or flow test. Inspect and clean all strainers in accordance with the manufacturer's instructions. Replace or repair damaged or corroded parts.
- b. Ensure pressure vacuum vent operates freely.
- c. Ensure gauges at pump unit and individual proportioner operate properly.
- d. Keep sensing line valves at the pump unit and individual proportioner stations open.
- e. Ensure power is available to the foam liquid pump.

2. Testing

- a. The operation test will verify that the proportioner is functioning properly.

3. Maintenance

- a. Run the foam concentrate pump every 5 years. Circulate foam concentrate back to the tank. Also, refer to the manufacturer's instructions and frequencies.
- b. At least every 5 years, service foam pumps, drive train, and drivers in accordance with the manufacturer's instructions and frequency.
- c. At least every 5 years, flush the balancing valve diaphragm through the diaphragm section with water or foam concentrate until fluid appears clear.
- d. Inspect the foam concentrate tank internally every 10 years for corrosion and sedimentation. Excessive sedimentation requires draining and flushing of the tank.

G. In-line balanced pressure proportioner

1. Inspection

Inspect monthly as follows.

- a. Flush mainline strainer (basket or screen) until clear after each operation or flow test. Inspect and clean all strainers in accordance with the manufacturer's instructions. Replace or repair damaged or corroded parts.
- b. Ensure the pressure vacuum vent operates freely.

- c. Ensure gauges at pump unit and individual proportioner operate properly.
- d. Sensing line valves at the pump unit and individual proportioner stations be open.
- e. Power be available to the foam liquid pump.

2. Testing

- a. The operation test will verify whether or not the proportioner is operating properly.

3. Maintenance

- a. Run the foam concentrate pump every 5 years. Circulate foam concentrate back to the tank. Also, refer to the manufacturer's instructions and frequencies.
- b. Service the foam pumps, drive train, and drivers in accordance with the manufacturer's instructions and frequency at least every 5 years.
- c. Flush the balancing valve diaphragm through the diaphragm section with water or foam every 5 years.
- f. Inspect the foam concentrate tank internally every 10 years for corrosion and sedimentation. Excessive sedimentation requires draining and flushing of the tank.

7.0 CORRECTIVE ACTION

7.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or A and B or C or D will be required until the repairs are complete.

7.2 Inspection

- A. Visually inspect the system before returning to service.

7.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a test of the main drain to verify that the control valve is open.
- C. Conduct a test using the alarm bypass connection to verify that the system local audible alarm and/or alarm signal to the monitoring service will operate within the required time.
- D. Consult the AHJ to determine whether or not a full flow test should be conducted on the repaired system.
- E. Hydrostatic and flush test any repaired parts of the system before returning to service.
- F. Test the fire detection subsystem to verify that all of the fire detectors are in place and will operate the deluge valve.

8.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

9.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 11
- D. NFPA 13
- E. NFPA 16
- F. NFPA 25
- G. NFPA 72
- H. NFPA 72E

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121 - WET STANDPIPE SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining wet standpipe systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance to the AHJ.

3.0 INSPECTION

- A. Monthly, visually check all components of the system, including piping, valves, hose connection, pipe supports, and allied equipment, to ensure that the system is free of corrosion, foreign material, physical damage, tampering, or other conditions that would prevent operation.
- B. Control valves - Visually inspect all control valves of the system at regular intervals as follows:
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with tamper switches - monthly.
 - 3. The inspection shall verify that the valves are
 - a. In the normal open or closed position
 - b. Properly sealed, locked, or supervised
 - c. Accessible
 - d. Provided with appropriate wrenches

- e. Free from external leaks
 - f. Provided with appropriate identification.
- C. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
- D. Backflow preventers - Inspect and maintain specialized backflow prevention devices, such as reduced pressure principle backflow preventers, double check valve assemblies, backflow preventers with intermediate atmospheric vents, and atmospheric vacuum breakers, in accordance with the manufacturer's instructions. In addition, inspect OS&Y isolation valves weekly to verify that they are in the normal positions. Valves secured with locks or that are electrically supervised should be inspected monthly. Reduced pressure backflow preventers should be inspected weekly to ensure that the differential sensing valve relief port is not continuously discharging.
- E. Hose valves - Visually inspect all hose valves weekly. Verify the following:
- 1. Hand wheel is not broken or missing
 - 2. Outlet hose threads are not damaged
 - 3. There are no leaks
 - 4. The reducer and cap is not missing.
- Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.
- F. Pressure regulating valves - Inspect all pressure regulating valves weekly to verify that they are:
- 1. Open
 - 2. Not leaking
 - 3. Maintaining downstream pressure per design criteria
 - 4. In good condition with handwheels installed.

Conduct a flow test on each valve initially, and at 5-year intervals thereafter, in accordance with the manufacturer's instructions. Tag the valves with the most recent testing and pressure setting.

Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

- G. FDCs - Inspect monthly. The inspection shall verify the following.
1. The FDCs are visible and accessible.
 2. Couplings or swivels are not damaged and rotate smoothly.
 3. Plugs or caps are in place and not damaged.
 4. If the FDC is plugged, or caps are not in place, inspect the interior of the connection for:
 - a. Obstructions
 - b. Whether or not the valve clapper is operational over its full range.
 5. Gaskets are in place and in good condition.
 6. Identification signs are in place.
 7. The check valve is not leaking.
 8. The automatic drain valve is in place and operating properly.
 9. Components are cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.
- H. Hose Systems
1. Visually inspect hose cabinets monthly for drainage and to make sure that the hose is properly racked in the cabinet and that the nozzle is attached. Existing unlined hose may continue in use; however, all new or replacement hose should be lined and listed in accordance with NFPA 14. (does the last part read correctly?)
 2. Monthly, visually inspect hose cabinet signs to verify proper signage.
 3. Annually test nozzles on standpipe systems through their full range of operation.
 4. Annually remove and rerack the 1-1/2-foot hose connected to standpipe systems so that it will not deteriorate at the bends. When the hose is reracked, different parts of the hose should be located at the bends. The gaskets at the hose connections should also be checked for deterioration and replaced if necessary. Hose on reels do not have to be reracked annually.
 5. Lubricate swing-out hose racks and hose reels annually with graphite so they operate easily.

6. Clean, repair, or replace components as necessary in accordance with the manufacturer's instructions.

4.0 TESTING

- A. Fully close and reopen the control valve annually.
- B. A qualified person shall conduct an initial flow test by flowing the required volume of water at the hydraulically most remote, highest, or dead-end hose connection of each zone of the standpipe system. When a flow test of the most hydraulically remote outlet is not practical, consult the AHJ for the appropriate location of the test. Conduct a flow test every 5 years thereafter.

Use the design requirements in effect at the time of the installation for all testing. The AHJ must approve the actual test method(s) and performance criteria in advance.

- C. Conduct hydrostatic tests every 5 years at no less than 200 psi for 2 hours, or at 50 psi in excess of the maximum pressure when maximum pressure is in excess of 150 psi, on all dry portions of a wet standpipe system. Measure the hydrostatic test pressure at the low elevation point of the individual system or zone being tested. The inside pipe should show no leakage.

Conduct hydrostatic tests on any system that has been modified or repaired.

- D. Flush test system initially and after any repairs. The minimum rate of flow should not be less than the water demand rate of the system, which is determined by the system design, or not less than that necessary to provide a velocity of 10 ft/s, whichever is greater. For all systems, continue the flushing operations for a sufficient time to ensure thorough cleaning. When planning the flushing operations, give consideration to disposing the water issuing from the test outlets.
- E. When provided, test waterflow alarms on a bimonthly basis. Test supervisory signals on a semi annual basis.

5.0 MAINTENANCE

- A. Control valves
 1. Lubricate the operating stems of OS&Y valves annually. Then close and reopen the valve to test its operation and distribution of the lubricant. Graphite or graphite in light oil should be used.
 2. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

- B. The following Table 121-1 is recommended for the inspection and maintenance of all standpipe systems.
- C. Provide additional maintenance as recommended by the manufacturer's instructions for all components of standpipe systems.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag at the FDC and hose valves indicating what portions of the system are out of service.
- B. Stop all hazardous operations, and/or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ decide if B and/or C will be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Conduct a hydrostatic test on any repaired portions of the system.
- C. Flush test any repaired piping before returning the system to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

Table 121-1. Inspection and Maintenance of Wet Standpipe Systems.
(sheet 1 of 2)

Check Points	Components	Corrective Action
Hose Valve Outlets		
1. Cap missing	1. Replace	
2. Fire hose connection damaged	2. Repair	
3. Valve handles missing	3. Replace	
4. Cap gaskets missing or deteriorated	4. Replace	
5. Valve leaking	5. Close or repair	
6. Visible obstructions	6. Remove	
7. Restricting device missing	7. Replace	
Pi pi ng		
1. Damaged piping	1. Repair	
2. Control valves damaged	2. Repair or replace	
3. Missing or damaged support device	3. Repair or replace	
4. Damaged supervisory devices	4. Repair or replace	
Hose (if installed)		
1. Inspect	1. Remove and inspect the hose, including gaskets, and rerack or rereel at intervals in accordance with NFPA 1962	
2. Mildew, cuts, abrasions, and deterioration evident	2. Replace with listed lined, jacketed hose.	
3. Coupling damaged	3. Replace or repair	
4. Gaskets missing or deteriorated	4. Replace	
5. Incompatible threads on coupling	5. Replace or provide thread adaptor	
6. Hose not connected to hose rack nipple or valve	6. Connect	
7. Hose test date outdated	7. Retest or replace in accordance with NFPA 1962.	

Table 121-1. Inspection and Maintenance of Wet Standpipe Systems.
(sheet 2 of 2)

Check Points	Components	Corrective Action
Hose Nozzle		
1. Hose nozzle missing.	1.	Replace with listed nozzle
2. Gasket missing or deteriorated	2.	Replace
3. Obstructions	3.	Remove
4. Nozzle does not operate smoothly	4.	Repair or replace
Hose Storage Device		
1. Difficult to operate	1.	Repair or replace
2. Damaged	2.	Repair or replace
3. Obstruction	3.	Remove
4. Hose improperly racked or rolled	4.	Remove
5. Nozzle clip in place and nozzle correctly contained?	5.	Replace if necessary
6. If enclosed in cabinet, will hose swing out at least 90 degrees?	6.	Repair or remove any obstructions
Cabinet		
1. Check overall condition for corroded or damaged parts	1.	Repair or replace parts. Replace entire cabinet if necessary.
2. Difficult to open	2.	Repair
3. Cabinet door will not open fully	3.	Repair or move obstructions
4. Door glazing cracked or broken	4.	Replace
5. If cabinet is break-glass type, is lock functioning properly?	5.	Repair or replace
6. Glass break device missing or not attached.	6.	Replace or attach
7. Not properly identified as containing fire equipment	7.	Provide identification
8. Visible obstructions	8.	Remove
9. All valves, hose, nozzles, fire extinguisher, etc., easily accessible	9.	Remove any material not related.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 14
- D. NFPA 25

122 - DRY STANDPIPE SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining dry standpipe systems.

2.0 PROCEDURE

- A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
 - 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

- B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Monthly, visually check all components of the standpipe and hose systems, including piping, valves, hose connections, pipe-clamp supports, and allied equipment, to ensure that the system is free of corrosion, foreign material, physical damage, tampering, or other conditions that would prevent operation.
- B. Hose valves - Weekly, visually inspect all hose valves. The inspection shall verify that the following:
 - 1. Hand wheel is not broken or missing
 - 2. Outlet hose threads are not damaged
 - 3. There are no leaks
 - 4. The reducer and cap is not missing.

Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

- C. Pressure regulating valves - Weekly, inspect all pressure regulating valves to verify that they are
1. Open
 2. Not leaking
 3. Maintaining downstream pressure per design criteria
 4. In good condition with handwheels installed.

Conduct a flow test on each valve initially and at 5-year intervals thereafter in accordance with the manufacturer's instructions. Tag the valves with the most recent testing and pressure setting.

Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

- D. FDCs - Inspect monthly to verify the following:
1. The FDCs are visible and accessible.
 2. Couplings or swivels are not damaged and rotate smoothly.
 3. Plugs or caps are in place and not damaged.
 4. If the FDC is plugged, or caps are not in place, inspect the interior of the connection for
 - a. Obstructions
 - b. Whether or not the valve clapper is operational over its full range.
 5. Gaskets are in place and in good condition.
 6. Identification signs are in place.
 7. The automatic drain valve is in place and operating properly.
 8. Components are cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.

E. Hose systems

1. Visually inspect hose cabinets monthly for drainage and to make sure that the hose is properly racked in the cabinet and that the nozzle is attached. Replace any unlined hose with all new listed, lined fire hose.
2. Visually inspect hose cabinet signs monthly to verify proper signage.

3. Test nozzles on hose connected to standpipes through their full range of operation annually.
4. Annually remove and rerack the 1-1/2-in. lined hose in the connected dry standpipe system so that it will not deteriorate at the bends. When the hose is reracked, different parts of the hose should be located at the bends. Check the gaskets at the hose connections for deterioration and replace if necessary. Hose on reels does not have to be reracked annually.
5. Annually lubricate swing-out hose racks and hose reels with graphite so they operate easily.
6. Clean, replace, or repair components as necessary in accordance with the manufacturer's instructions.

4.0 TESTING

- A. A qualified person shall conduct an initial flow test by releasing the required volume of water at the design pressures to the hydraulically most remote, highest, or dead-end hose connection of each zone of the standpipe system. When a flow test of the most hydraulically remote outlet is not practical, consult the AHJ for the appropriate location of the test. Conduct a flow test every 5 years thereafter.

Use the design requirements in effect at the time of the installation for all testing. Approve the actual test method(s) and performance criteria in advance with the AHJ.

- B. Every 5 years, conduct hydrostatic tests of not less than 200 psi for 2 hours, or at least 50 psi in excess of the maximum pressure when the maximum pressure is in excess of 150 psi. Measure the hydrostatic test pressure at the low elevation point of the individual system or zone being tested. The inside standpipe piping shall show no leakage. Take care to thoroughly drain the standpipe after each test.

Conduct additional hydrostatic tests on any system that has been modified or repaired.

5.0 MAINTENANCE

- A. The following Table 122-1 is recommended for the inspection and maintenance of all standpipe systems.
- B. Perform additional maintenance as recommended by the manufacturer's instructions on all components of the dry standpipe and hose system.

Table 122-1. Inspection and Maintenance of Dry Standpipe Systems.
(sheet 1 of 2)

Check Points	Components	Corrective Action
Hose Valve Outlets		
1. Cap missing	1. Replace	
2. Fire hose connection damaged	2. Repair	
3. Valve handles missing	3. Replace	
4. Cap gaskets missing or deteriorated	4. Replace	
5. Valve leaking	5. Close or repair	
6. Visible obstructions	6. Remove	
7. Restricting device missing	7. Replace	
Pi pi ng		
1. Damaged piping	1. Repair	
2. Control valves damaged	2. Repair or replace	
3. Missing or damaged support device	3. Repair or replace	
4. Damaged supervisory devices	4. Repair or replace	
Hose (i f i n s t a l l e d)		
1. Inspect	1. Remove and inspect the hose, including gaskets, and rerack or rereel at intervals in accordance with NFPA 1962	
2. Mildew, cuts abrasions, and deterioration evident	2. Replace with listed lined, jacketed hose	
3. Coupling damaged	3. Replace or repair	
4. Gaskets missing or deteriorated	4. Replace	
5. Incompatible threads on coupling	5. Replace or provide thread adaptor	
6. Hose not connected to hose rack nipple or valve	6. Connect	
7. Hose test date outdated	7. Retest or replace in accordance with NFPA 1962	

Table 122-1. Inspection and Maintenance of Dry Standpipe Systems.
(sheet 2 of 2)

Check Points	Components	Corrective Action
Hose Nozzle		
1. Hose nozzle missing. nozzle	1.	Replace with listed
2. Gasket missing or deteriorated	2.	Replace
3. Obstructions	3.	Remove
4. Nozzle does not operate smoothly	4.	Repair or replace
Hose Storage Device		
1. Difficult to operate	1.	Repair or replace
2. Damaged	2.	Repair or replace
3. Obstruction	3.	Remove
4. Hose improperly racked or rolled	4.	Remove
5. Nozzle clip in place and nozzle correctly contained?	5.	Replace if necessary
6. If enclosed in cabinet, will hose swing out at least 90 degrees?	6.	Repair or remove any obstructions
Cabinet		
1. Check overall condition for corroded or damaged parts	1.	Repair or replace parts Replace entire cabinet if necessary
2. Difficult to open	2.	Repair
3. Cabinet door will not open fully	3.	Repair or move obstructions
4. Door glazing cracked or broken	4.	Replace
5. If cabinet is break-glass type, is lock functioning properly?	5.	Repair or replace
6. Glass break device missing or not attached.	6.	Replace or attach
7. Not properly identified as containing fire equipment	7.	Provide identification
8. Visible obstructions	8.	Remove
9. All valves, hose, nozzles, fire extinguisher, etc., easily accessible	9.	Remove any material not related

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag at the FDC and hose valves indicating what portions of the system are out of service.
- B. Stop all hazardous operations, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ shall decide if B and/or C will be required until repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Conduct a hydrostatic test on any repaired portions of the system.
- B. Flush test any repaired piping before returning the system to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 14
- D. NFPA 25

123 - MANUAL WATER SPRAY SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining manual water spray systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Control valves - Visually inspect all control valves of the system at regular intervals as follows.

- 1. Sealed valves - weekly.
- 2. Locked valves and valves with tamper switches - monthly.
- 3. The inspection shall verify that the valves are
 - a. In the normal open or closed position
 - b. Properly sealed, locked, or supervised
 - c. Accessible
 - d. Provided with appropriate wrenches
 - e. Free from external leaks
 - f. Provided with appropriate identification.

B. Weekly inspection - Visually check the following:

1. Nozzles for blockage
2. That no machinery or equipment has been changed so it now blocks nozzle discharge
3. Nozzle positioning.

C. Annual inspection

1. Visually inspect all piping, fittings, and hangers for corrosion and proper drainage.

4.0 TESTING

- A. Follow manufacturer's instructions for specific component testing procedures.
- B. Fully cycle the control valve annually.
- C. At least annually, make a full system flow test to evaluate the nozzle arrangement, discharge pattern, and obstructions to spray patterns, and to check for nozzle blockages. When more than one system might operate in the event of a fire, all such systems should be simultaneously flow tested. Measure the pressure at the highest, most hydraulically remote nozzle to ensure that it meets the design pressure. This pressure measurement can be taken by removing the nozzle, installing a tee with a pressure gauge attached, and replacing the nozzle in the tee. At the end of the test, the gauge and tee should be removed and the nozzle replaced. The system piping shall show no leakage during the test. (Strainers should be inspected after each operation and cleaned if necessary.)

5.0 MAINTENANCE

A. Control valves

1. Annually lubricate the operating stems of OS&Y valves. Then, completely close and reopen the valve to test its operation and distribution of the lubricant. Graphite or graphite in light oil should be used.
2. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

- B. Clean strainers annually. This will generally involve shutting off the water supply and removing the strainer to clean it. Some strainers are self-cleaning and merely require rotating the operating wheel.

- C. Perform additional maintenance according to the manufacturer's instructions on all components of the water spray system.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Stop all hazardous operations, or
- B. Start a recorded fire watch within 1 hour of the outage, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 8 hours or A or B or C shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available at the system connection.
- B. Hydrostatic and flush test any repaired parts of the system before returning to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 15
- D. NFPA 25

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131 - HALON 1301 (TOTAL FLOODING)

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining Halon 1301 fire extinguishing systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system weekly.
- B. Check weekly to make sure that the space being protected has not been altered.
- C. Visually inspect all openings (doors, dampers, etc.) of the space being protected to verify that they are closed or are connected for releasing automatically upon system operation.
- D. Check containers monthly for physical damage and proper mounting.
- E. Check the container pressure gauges (if required) monthly for proper operating pressures. If the readings shows more than a 10% loss in required pressure, refill or replace the cylinder.
- F. For fire detection system inspection, see Procedure 151.

4.0 TESTING

- A. Weigh each Halon container with discharge control head semiannually. If a container shows a loss in net weight of more than 10%, it shall be refilled or replaced. The weight and pressure of the

container shall be recorded on a tag attached to each container.

- B. Operate control activation devices at least annually (except explosive squibs).
- C. Conduct an operating test of the system annually. Control heads are to be removed before starting the test. Test all auxiliary functions, such as the damper release and door release.
- D. Conduct all tests with trained personnel according to the manufacturer's instructions.
- E. See Procedure 151 for fire detection system testing.

5.0 MAINTENANCE

- A. At 20-year intervals, perform a hydrostatic test on the cylinders and hoses. When a system has been discharged and it has been a minimum of 5 years since the last hydrostatic test, another hydrostatic test is required before refilling the cylinders.
- B. Conduct any other maintenance in accordance with the manufacturer's instructions.
- C. See Procedure 151 for fire detection system testing.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and
- D. Provide an alternate means to protect the hazardous operations.
- E. Immediately begin repair operations or B or C and D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Weigh Halon containers and check pressure before returning them to service.
- B. Conduct an operating test of the system before returning it to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 12A
- D. NFPA 72
- E. NFPA 72E

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132 - HALON 1211 (TOTAL FLOODING)

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining a Halon 1211 fire extinguishing system.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system weekly.
- B. Check weekly to make sure that the space being protected has not been altered.
- C. Visually inspect all openings (doors, dampers, etc.) of the space being protected to verify that they are closed or are connected for releasing automatically upon system operation.
- D. Check containers monthly for physical damage and proper mounting.
- E. Check the container pressure gauges monthly for proper operating pressures. If the readings show more than a 10% loss in pressure from that required, refill or replace the cylinder.
- F. See Procedure 151 for fire detection system testing.

4.0 TESTING

- A. Weigh each Halon container with discharge control head semiannually. If a container shows a loss in net weight of more than 10%, it should be refilled or replaced. Record the weight and pressure of

the container on the attached tag.

- B. Operate control activation devices at least annually (except explosive squibs).
- C. Conduct an operating test of the system annually. Control heads are to be removed before starting the test. Test all auxiliary functions, such as damper release, door release, etc.
- D. Conduct all tests with trained personnel according to the manufacturer's instructions.
- E. See Procedure 151 for fire detection system testing.

5.0 MAINTENANCE

- A. At 20-year intervals, perform a hydrostatic test on the cylinders and hoses. When a system has been discharged and it has been a minimum of 5 years since the last hydrostatic test, another hydrostatic test is required before refilling the cylinders.
- B. Conduct any other maintenance in accordance with the manufacturer's instructions.
- C. For fire detection system testing, see Procedure 151.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and
- D. Provide an alternate means to protect the hazardous operations.
- E. Immediately begin repair operations, or B or C and D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Weigh Halon containers and check pressure before returning them to service.
- B. Conduct an operating test of the system before returning it to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 12B
- D. NFPA 72
- E. NFPA 72E

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133 - DRY CHEMICAL SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining the dry chemical fire extinguishing systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. If the system is designed to have nozzle caps, check them weekly to ensure that they are in place.
- B. Weekly, check to make sure that no foreign substances are accumulating on the fusible links and nozzles.
- C. Weekly, check to make sure that corrosive cleaning solutions are not being used on links, cables, or nozzles.
- D. Weekly, check the protected area for alterations that may have occurred.
- E. Weekly, check the nozzles for physical damage and proper alignment.
- F. If the dry chemical agent is stored in a pressurized container, check the pressure semiannually. If the gauges show more than a 10% loss in pressure from that required, refill or replace the container.

- G. If the system has a separate expellent gas cartridge, check cartridge for proper operation semiannually. For nitrogen cartridges, this requires checking of pressure. For CO₂ cartridges, this requires weighing the cylinder and comparing it with the manufacturer's minimum. If the cartridge shows a 10% loss, refill or replace.
- H. Annually, check the dry chemical agent for lumping or caking in systems having a separate expellent gas cartridge. If lumping or caking is noted, discard and replace the dry chemical agent.
- I. For fire detection subsystems other than a fusible link, refer to Procedure 151.
- J. Weekly, check openings (doors, dampers, etc.) of the space being protected to verify that they are closed or connected for automatic releasing upon system operation.
- K. Check fuel and power shutdown devices on an annual basis.

4.0 TESTING

- A. Conduct an operating test of each dry chemical system annually. This involves testing all system components without discharging dry chemical agent. Refer to Procedure 151 for fire detection system testing.
- B. Conduct a discharge (bag test) where required by the AHJ every 6 years for each dry chemical system. Securely place bags over each nozzle and then activate the system. Weigh the amount of dry chemical agent discharged from each nozzle and compare it to that required by the design's minimum conditions. If any of the nozzles do not release enough dry chemical agent, the system needs to be checked for blockage. After the discharge test, blow out the system with air before resetting it.
- C. Conduct a hydrostatic test every 12 years on the following:
 - 1. Dry chemical chambers
 - 2. Auxiliary pressure containers
 - 3. Valve assemblies
 - 4. Hoses and fittings
 - 5. Check valves
 - 6. Directional valves
 - 7. Manifolds.

All equipment passing the test should be thoroughly dried before recharging.

- D. For fire detection system testing, see Procedure 151.

5.0 MAINTENANCE

- A. Perform maintenance promptly on any components that fail to operate properly during the annual operating tests.
- B. Blow out the entire system with air after any operation.
- C. Conduct any other maintenance recommended in the manufacturer's instructions.
- D. For fire detection system maintenance, see Procedure 151.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations or
- C. Start a recorded fire watch within 1 hour of the outage, and
- D. Provide an alternate means to protect the hazardous operations.
- E. Immediately begin repair operations or B or C and D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. If the dry chemical agent is stored in a pressurized cylinder, check the pressure before returning to service.
- B. If the system has a separate expellant gas cartridge, check each cartridge for proper operation before returning to service:
 - 1. Nitrogen cartridges - check pressure

2. CO₂ cartridges - weigh cylinder

C. Conduct an operating test of the system before returning to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 17
- D. NFPA 72
- E. NFPA 72E

134 - WET CHEMICAL SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining the wet chemical fire extinguishing systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. On a monthly basis, conduct inspections in accordance with the manufacturer's listed installation and maintenance manual. As a minimum, this "quick check" or inspection should include the following:
 - 1. The extinguishing system is in its proper location
 - 2. Manual activation devices are unobstructed
 - 3. Tamper indicators and seals are intact
 - 4. Maintenance tag or certificate is in place
 - 5. No obvious physical damage or condition exists that may prevent operation
 - 6. Pressure gauge(s), if provided, are in operable range
 - 7. Nozzle blow-off caps are intact and undamaged
 - 8. The protected area contains no alterations

9. Fuel and power shutdown devices are in good condition
 10. Piping, fittings, and hangers are in good repair.
- B. Check each expellent gas cartridge semiannually for proper operation. For nitrogen cartridges, this requires checking of pressure. For CO₂ cartridges, this requires weighing the cylinder and comparing it with the manufacturer's minimum. If the cartridges show a 10% loss, refill or replace.
 - C. Inspect wet chemical containers that are pressurized semiannually. If the container has lost more than 10% of its design pressure, refill or replace it.
 - D. For fire detection subsystem inspection, refer to Procedure 151.

4.0 TESTING

- A. Conduct an operating test of each wet chemical system annually. Include a check of the detection system, alarms, and releasing device, including manual stations and other associated equipment (see Procedure 151 and manufacturer's instructions).
- B. For fire detection system testing, see Procedure 151.
- C. Subject the following parts of wet chemical extinguishing systems to a hydrostatic pressure test at intervals not exceeding 12 years:
 1. Wet chemical containers
 2. Auxiliary pressure containers
 3. Hose assemblies.

Exceptions:

1. Auxiliary pressure containers not exceeding 2 in. in outside diameter and less than 2 ft in length.
2. Auxiliary containers bearing the U. S. Department of Transportation (DOT) "3E" marking.

Note: DOT or Canadian Transportation Commission (CTC) marked cylinders may require more frequent test intervals.

All tested equipment shall be thoroughly dried before reuse.

5.0 MAINTENANCE

- A. Perform maintenance promptly on any components that fail to operate properly during the annual operating tests.

- B. Recharge all wet chemical systems after use or as indicated by an inspection in accordance with the manufacturer's instructions.
- C. Conduct any other maintenance recommended in the manufacturer's instructions.
- D. For fire detection system maintenance, refer to Fire Alarm Inspection, Testing, and Maintenance procedure.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following:

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations or
- C. Start a recorded fire watch within 1 hour of the outage, and
- D. Provide an alternate means to protect the hazardous operations.
- E. Immediately begin repair operations or B or C and D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Conduct an operating test as mentioned previously before returning the system to service.
- B. Check the level of wet chemical and expellant gas containers as mentioned previously before returning the system to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 17A
- D. NFPA 72
- E. NFPA 72E

135 - HIGH EXPANSION FOAM SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining high expansion foam fire protection systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Control valves - Visually inspect all control valves of the system at regular intervals as follows:

- 1. Sealed valves - weekly
- 2. Locked valves and valves with tamper switches - monthly
- 3. Verify that each control valve has the proper signage indicating what system or portion of system it controls - monthly
- 4. Fully close and reopen the control valve - annually
- 5. Annually, lubricate the operating stems of OS&Y valves with graphite or graphite in light oil. Then completely close and reopen the valve to test its operation and distribution of the lubricant
- 6. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

- B. Make weekly visual inspections to verify the following:
 - 1. Foam concentrate pumps, tanks, and lines are not damaged or leaking. Concentrate level in tanks is normal.
 - 2. Concentrate pumps operate properly.
 - 3. All valves for the foam system are properly positioned.
 - 4. Control panel lights are operating properly.
 - 5. All disconnects in the control panel are in the ON position.
 - 6. Water supply pressure is normal.
 - 7. Piping, ducts, fittings, and hangers are in good repair.
- C. Refer to Procedure 151 for fire detection system inspection.
- D. Check strainers after each use and test.
- E. Inspect foam chambers annually for obstructions such as beehives and bird nests. Also verify that the vapor seal is in place.

4.0 TESTING

- A. Test the entire detection system semiannually for proper operation (see Procedure 151).
- B. Semiannually, drain about 5 gal of foam liquid from the bottom of the tank. Let this foam liquid stand for several hours so any scale settles to the bottom of the can. Return the sample to the tank by pouring it through a strainer. The presence of scale can then be noted and a decision made as to whether the tank should be cleaned.
- C. Check the quality of the foam concentrate annually. The concentrate should be checked for evidence of sludging or deterioration. Send samples to the manufacturer for qualitative testing.
- D. Conduct a system test each year. Preferably, this should include discharge of foam to make sure that all parts work properly.

5.0 MAINTENANCE

- A. Monthly, operate the foam liquid pump for 30 to 60 seconds. Follow the manufacturer's instructions for other pump maintenance.
- B. Service the pressure-vacuum vent on the foam concentrate storage tank semiannually (see manufacturer's instructions).
- C. Maintain the system in full operating condition at all times.

Correct any troubles or impairments discovered during inspection or testing at once.

D. For fire detection system maintenance, see Procedure 151.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign at the FDC and system control valve indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and
- D. Provide an alternate means to protect the hazardous operations.
- E. Immediately begin repair operations or B or C and D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume is available at the system connection.
- B. The AHJ shall decide whether or not a discharge test should be conducted on the repaired system.
- C. Hydrostatic and flush test any repaired piping of the system before returning to service.
- D. Test the fire detection subsystem to verify that all of the fire detectors are in place and will activate the high expansion foam controls.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 11A
- D. NFPA 72
- E. NFPA 72E

136 - CARBON DIOXIDE EXTINGUISHING SYSTEM (HIGH PRESSURE)

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining high pressure CO₂ fire extinguishing systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system weekly for any physical damage.
- B. Weekly inspect all openings of the room(s) being protected to make sure self-closing or automatic releasing devices will function on CO₂ extinguishing system operation.
- C. Check weekly to make sure that the space being protect has not been altered.
- D. For fire detection subsystem inspection, see Procedure 151.
- E. Annually, examine all system hoses for damage, including those used as flexible connectors. If visual examination shows any deficiency, replace the hose.

4.0 TESTING

- A. Weigh CO₂ cylinders with discharge control valve semiannually. If a container shows a loss in net weight of more than 10%, refill or replace it. Record the weight and pressure of the cylinder on the attached tag.

- B. Operate control heads at least annually.
- C. Conduct an operating test of the system annually. Control heads are to be removed before starting any testing.
- D. Test all hoses, including those used as flexible couplings, every 5 years.
- E. All tests shall be conducted by trained personnel in accordance with the manufacturer's instructions.
- F. For fire detection subsystem testing, see Procedure 151.
- G. Test supervisory devices in accordance with the manufacturer's instructions.

5.0 MAINTENANCE

- A. At 12-year intervals, perform a hydrostatic test on the cylinders, tanks, and hoses. When the system has been discharged and it has been at least 5 years since the last hydrostatic test, perform a hydrostatic test before refilling the storage containers.
- B. For fire detection subsystem maintenance, see Procedure 151.
- C. Conduct any other maintenance in accordance with the manufacturer's instructions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, and
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations immediately or B or C and D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Weigh CO₂ cylinders and check pressure before returning to service.
- B. Conduct an operating test of the system before returning it to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 12
- D. NFPA 72
- E. NFPA 72E

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137 - CARBON DIOXIDE EXTINGUISHING SYSTEM (LOW PRESSURE)

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining low-pressure CO₂ fire extinguishing systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Make arrangements with operations to make the protected area available for the time needed to conduct the inspection, testing, and maintenance.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Visually inspect the entire system weekly for any physical damage.
- B. Weekly, inspect all openings of the room(s) being protected to make sure self-closing or automatic releasing devices will function on CO₂ extinguishing system operation.
- C. Weekly, check to make sure that the space being protected has not been altered.
- D. Check the liquid level weekly in each low-pressure container by observing the liquid-level gauges. Refill the container if the container is 10% above the minimum capacity.
- E. For fire detection subsystem inspection, see Procedure 151.
- F. Annually, examine all system hoses, including those used as flexible connectors, for damage. If visual examination shows any deficiency, replace the hose.

4.0 TESTING

- A. Operate control heads at least annually.
- B. Conduct an operating test of the CO₂ discharge system annually.
- C. Test all hoses, including those used as flexible couplings, every 5 years.
- D. Conduct all tests by trained personnel in accordance with the manufacturer's instructions.
- E. For fire detection subsystem testing, see Procedure 151.
- F. Test supervisory devices in accordance with the manufacturer's instructions.

5.0 MAINTENANCE

- A. At 12-year intervals, perform a hydrostatic test on the storage tank.
- B. For fire detection subsystem maintenance, see Procedure 151.
- C. Conduct any other maintenance in accordance with the manufacturer's instructions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following:

- A. Post a sign on the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations or
- C. Start a recorded fire watch within 1 hour of the outage, and
- D. Provide an alternate means to protect the hazardous operations.
- E. Immediately begin repair operations or B or C and D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Conduct an operating test of the system before returning it to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 12
- D. NFPA 72
- E. NFPA 72E

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138 - WATER SPRAY SYSTEM (LOCAL APPLICATION)

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining local application water spray systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

A. Conduct a weekly inspection to verify the following.

- 1. The entire system is free of physical damage.
- 2. Nozzles are unobstructed and free of grease buildup.
- 3. Fusible links are in place and free of grease buildup.
- 4. Corrosive cleaning agents have not been used on nozzles or system piping.
- 5. The system's water supply is in service.
- 6. The protected hazard has not been altered.

B. Control valves - Visually inspect all control valves at regular intervals as follows:

- 1. Sealed valves - weekly.
- 2. Locked valves and valves with tamper switches - monthly.
- 3. Verify that each control valve has the proper signage

indicating what system or portion of system it controls - monthly.

4. Annually, lubricate the operating stems of OS&Y valves with graphite or graphite in light oil. Then completely close and reopen the valve to test its operation and distribution of the lubricant.
5. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.

4.0 TESTING

- A. Conduct a bimonthly test of the system alarms and automatic fuel shutdowns by using the bypass valve.
- B. Conduct a test of the main drain annually to verify that the control valve is open and that water is available to the system.

5.0 MAINTENANCE

- A. Correct any deficiencies discovered during inspections or tests immediately.
- B. Conduct all other maintenance in accordance with the manufacturer's instructions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag on the control valve indicating what portion of the system is out of service.
- B. Remove all protected equipment from service until repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate water quantity and pressure is available at the system's connection.

- B. Conduct a test of the bypass valve to verify that the system local alarm and fuel shutdown devices are functioning properly.
- C. Hydrostatic and flush test any repaired portions of the system before returning it to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 13
- D. NFPA 15
- E. NFPA 96

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141 - POND OR LAKE WATER SUPPLY

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining the pond or lake water supply.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Inspect the water level and condition of the water in the pond daily.
- B. Inspect the wet pit, where installed, and suction crib weekly to make sure they are clear of debris that may affect the intake water. During cold weather, inspect the wet pit daily to make sure the temperature is maintained at a minimum of 40 °F.
- C. Inspect the screens for the suction crib monthly and clean, repair, or replace as necessary.
- D. Annually, inspect foundations supporting fire pumps over wet pits for corrosion and physical damage.
- E. Control valves - Visually inspect all control valves of the system at regular intervals as follows:
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with taper switches - monthly.
 - 3. Verify that each control valve has the proper signage indicating what system or portion of system it controls -

monthly.

4. Fully close and reopen the control valve - annually.
 5. Annually, lubricate the operating stems of OS&Y valves with graphite or graphite in light oil. Then completely close and reopen the valve to test its operation and distribution of the lubricant.
 6. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.
- F. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
- G. Backflow preventers - Inspect and maintain specialized backflow prevention devices, such as reduced pressure principle backflow preventers, double check valve assemblies, backflow preventers with intermediate atmospheric vents, and atmospheric vacuum breakers, in accordance with the manufacturer's instructions. In addition, inspect OS&Y isolation valves weekly to verify that they are in the normal positions. Valves secured with locks or that are electrically supervised should be inspected monthly. Reduced pressure backflow preventers should also be inspected weekly to ensure that the differential sensing valve relief port is not continuously discharging.

4.0 TESTING

No requirements.

5.0 MAINTENANCE

- A. Maintain all equipment in proper working condition, consistent with the manufacturer's instructions.
- B. Maintain valve pit and valve or heater houses at a minimum temperature of 40 °F, weather tight, and free of water accumulations.
- C. Ensure repair work and replacement parts meet the original design criteria and installation standard of NFPA 22.
- D. Flush strainers until clear after each operation or flow test. Inspect and clean all strainers in accordance with manufacturer's instructions. Replace or repair damaged or corroded parts.
- E. Maintain wet pits free of debris and at a minimum temperature of

40 °F.

- F. Maintain the reservoir water at the full level or at the designed water level, sufficient to provide proper submergence for the pump.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place tags at all control valves, FDCs, and hydrants dependent upon that particular system.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage if the system supplies an automatic suppression system, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours or B or C or D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Conduct a flow test as per DOE Fire Protection Inspection, Testing, and Maintenance Procedures (Appendix B) before returning the system to service.
- B. Hydrostatic and flush test repaired portions of system piping before returning the system to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 1231

142 - TANK WATER SUPPLY SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining the tank water supply system.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. At least monthly, visually inspect the water level and the condition of the water in the tank to verify that the quality and quantity of stored water meets minimum design conditions.
- B. At least monthly, visually inspect the exterior of the tank, supporting structure, sway bracing, and the catwalks or ladders, where provided, for signs of obvious damage or weakening.
- C. Control valves - Visually inspect all control valves of the system at regular intervals as follows:
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with tamper switches - monthly.
 - 3. Verify monthly that each control valve has the proper signage indicating what system or portion of system it controls.
 - 4. Fully close and reopen the control valve - annually.

5. Annually, lubricate the operating stems of OS&Y valves with graphite or graphite in light oil. Then completely close and reopen the valve to test its operation and distribution of the lubricant.
 6. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.
- D. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
 - E. Backflow preventers - Inspect and maintain specialized backflow prevention devices, such as reduced pressure principle backflow preventers, double check valve assemblies, backflow preventers with intermediate atmospheric vents, and atmospheric vacuum breakers, in accordance with the manufacturer's instructions. In addition, inspect OS&Y isolation valves weekly to verify that they are in the normal positions. Valves secured with locks or that are electrically supervised should be inspected monthly. Reduced pressure backflow preventers should be inspected weekly to ensure that the differential sensing valve relief port is not continuously discharging.
 - F. Inspect the interior of the tank at least every 5 years.
 - G. At least monthly, inspect the area surrounding the tank and supporting structure, where provided, to ensure the area is free of the following:
 1. Combustible storage, trash, debris, brush, or material that could present a fire exposure.
 2. Accumulations of material on or near parts that could result in accelerated corrosion.
 3. Ice build up.
 4. Erosion (embankment-supported rubberized fabric [ESRF] water tanks only).
 - H. Visually inspect exterior seams and rivets (steel tanks) for leakage at least annually. Caulk any leaking seams. If there is not enough metal at the caulking edge, judicious welding can be used unless the rest of the steel plates are so badly corroded that replacement is needed.
 - I. Visually inspect the roof of storage tanks for structural stability and signs of rust annually.
 - J. Annually, inspect the hoops and grillage of wooden tanks.

- K. Annually, inspect exterior painted, coated, or insulated surfaces of tanks and supporting structures, where provided, for signs of degradation.
- L. Check the drain outlet for leaks in ESRF water tanks annually.
- M. Check the fabric for wear in rubberized water tanks annually. Patch worn or torn sections of ESRF tanks as needed.
- N. Check fabric outer protective paint for oxidation or weather checking in ESRF water tanks annually.
- O. At least monthly, inspect the air pressurized water in pressure tanks.
- P. Annually, have the interior of pressure tanks inspected by a qualified pressure-vessel inspector.
- Q. During the heating season, check the heating system of a water storage tank within 2 months before starting the heating system and at least daily during the heating season.
- R. Inspect and record the water temperature daily (cold weather only). The coldest temperature should not be less than 40 °F unless supervised.
- S. At least annually, inspect expansion joints, where provided, for leaks and cracks. If they leak, repack and adjust them.
- T. Examine all paint at least every year for flaking or cracking.

4.0 TESTING

- A. Flow tests need to be conducted annually for all water supply systems. Record these tests and compare with previous tests to make sure that equipment is performing properly and that all valves that should be open are open.
 - 1. For gravity tanks and pressure tanks, this test consists of opening a drain for the tank or sprinkler system. Record both the static (no flow) pressure and full flow pressure. Compare these pressures with those from previous tests; the results should be within 2 to 3 lb of being identical. If full flow pressures are significantly lower, check all valves between the water supply and the test point to ensure that they are fully open.
 - 2. For ground level or underground tanks, the annual test is accomplished in conjunction with the fire pump full flow tests.
- B. Semi annually, test level indicators for accuracy and freedom of

movement.

- C. Test low water temperature supervisory signals, where required, weekly during cold weather and semi annually if temperatures do not drop below 40 °F.
- D. Monthly, test high water-temperature limit switches on tank heating systems, where installed, whenever the heating system is in service. If supervised, then test semi annually.
- E. Test high and low water-level supervisory signals at least semi annually.
- F. Test pressure gauges with a calibrated gauge in accordance with the manufacturer's instructions at least every 5 years. Recalibrate or replace gauges not accurate to within 3% of the scale of the gauge being tested.

5.0 MAINTENANCE

- A. Maintain the tank at the full or designed water level.
- B. Maintain the interior and exterior of any tank, along with the supporting structure, where provided, free of peeling paint, aquatic growth, sediment, foreign matter, tools, painting equipment, or any other material that may interfere with proper operation of the tank. Access to the interior of ESRF tanks can be achieved by draining the water and inflating the tank as if it were an air-supported structure.
- C. Drain or flush the sediment from the tank annually.
- D. Protect the tank and supporting structure, where provided, from rot, corrosion, rust, mechanical damage, accumulation of debris, and sediment. Maintain the tops of foundation piers at least 6 in. above ground level.
- E. Replace the horizontal, radial spider rods, usually at the top of upper, cylindrical tank plates, if broken or badly corroded, making sure that no pieces drop into the water tank.
- F. Maintain cathodic protection, where installed, in accordance with the manufacturer's instructions.
- G. Keep the roof hatch cover and the door at the top of front proof castings fastened to prevent wind damage and to keep out birds.
- H. Maintain tank thermometers in accordance with the manufacturer's instructions.
- I. At least annually, fully cycle all tank drain valves.

- J. Clean screened or open vents in tanks at least annually.
- K. Maintain valve pits and valve or heater houses at a minimum temperature of 40 °F, and keep weather-tight and free of water accumulation.
- L. Maintain tank heating systems in accordance with the manufacturer's instructions. The coldest water in the tank shall not be less than 40 °F.
- M. Repair work and replacement parts must meet the original design criteria and NFPA 22.
- N. Repair work and replacement parts must be made only with materials that will not become loose or dislodged and obstruct the outlet.
- O. Complete and test all welding performed on the tank in accordance with AWWA D100 (AWS D5. 2).
- P. Paint steel and iron work every 5 years or as necessary to prevent corrosion.
- Q. Repaint only on dry surfaces that are thoroughly cleaned of all loose paint, rust, scale, or other surface contamination.
- R. During interior tank maintenance and painting activities, use a protective cover of no more than a few sheets of paper to cover the outlet opening. Remove this protective covering before returning the tank to service.
- S. Repainting of steel tanks:
 - 1. Clean all interior surfaces of steel tanks exposed to water immersion or the vapor phase zone above the high water level by near white blasting per Steel Structures Painting Council (SSPC)-SP10 or pickling per SSPC-SP8. Prime surfaces in accordance with the requirements for Inside Painting System No. 2 (wash primer per SSPC-PT3, plus one coat of vinyl per SSPC-Paint No. 9) or Inside Paint System No. 4 (one coat of vinyl paint per Bureau of Reclamation Specification VR-3) of AWWA Standard D102. 78.
 - 2. Clean all exterior surfaces and inside dry surfaces (pedestal tanks) by commercial blasting per SSPC-SP6 or pickling per SSPC-SP8. Prime with one coat of red lead alkyd per Type II or III of Federal Specification TT-P-86 or a suitable proprietary primer. These procedures should be done in accordance with the requirements for Outside Paint System No. 1 of AWWA Standard D102. 78.
 - 3. The appropriate primers for other interior and exterior paint systems may be used, provided permission is first obtained from the AHJ.

4. During repainting, all weld seams, unprimed margins, and any areas on which the primer (if preprimed) has been damaged shall be cleaned and patch primed with the same primer.
 5. All finish coat painting for interior (wet) surfaces shall be in accordance with the requirements for Inside Paint Systems No. 2 or No. 4 of AWWA Standard D102.78, using the same basic system throughout. For System No. 2, use one complete field coat of vinyl per SSPC-Paint No. 9 and two complete coats of vinyl aluminum per SSPC-Paint No. 8 to provide a minimum total system dry film thickness of 4.5 mils (112 microns). As an alternate, the two final coats may be white vinyl per Bureau of Reclamation Specification VR-3 to provide a minimum total system dry film thickness of 5.0 mils (125 microns). A 5.0-mil (125-micron) minimum total thickness with one additional coat may be specified by the purchaser. For System No. 4, use three complete field coats in contrasting colors of vinyl paint per Bureau of Reclamation Specification VR-3 to provide a minimum total system dry film thickness of 6.0 mils (150 microns).
 6. All exterior and inside dry finish coat painting must be in accordance with the requirements for Outside Paint System No. 1 of AWWA Standard D102.78. Use two coats of aluminum or alkyd enamel in a color specified by the purchaser to provide a minimum total system dry film thickness of 3.5 mils (87 microns) for aluminum finishes and 4.5 mils (112 microns) for alkyd enamels. As provided by Outside Paint System No. 4 of AWWA D102.78, permit the purchaser to specify an extra complete coat of primer for a total minimum system dry film thickness of 5.0 mils (125 microns) for aluminum finishes and 6.0 mils (150 microns) for alkyd enamels for the more severe atmospheric exposures.
 7. Other finish coats may be used, provided they are compatible with the primers and permission is first obtained from the AHJ.
 8. Painting application. All painting shall be accomplished in accordance with the appropriate requirements of SSPC Paint Application Specification No. 1 ("Shop, Field, and Maintenance Painting").
- T. The top surface of ESRF tanks must be repainted periodically with frequency dependent upon the material used (consult AHJ).
- U. Repainting ESRF tanks. Complete the preparation and repainting of ESRF tanks in accordance with the particular tank manufacturer's instructions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Stop all hazardous operations, or
- B. Start a recorded fire watch if the system supplies automatic suppression systems within 1 hour of the outage, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 8 hours or A or B or C shall be required until the repairs are complete.
- E. Place a tag at all FDCs, applicable hydrants, and control valves stating what portions of the system are out of service.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Conduct a flow test per 4.0, "Testing," before returning the system to service.
- B. Hydrostatic and flush test repaired portions of system piping before returning the system to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 22
- D. NFPA 25

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143 - FIRE PUMPS

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining the fire pumps.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Check the pressure on all fire pump gauges weekly.
- B. Check for automatic indication of controller lights.
- C. Check all valves weekly to make sure they are open.
- D. Weekly inspect the pump room to make sure it is clean, dry, orderly, and free of miscellaneous storage.
- E. During cold weather, daily inspect the pump room to see that it is kept at least at 40 °F.
- F. Control valves - Visually inspect all control valves of the system at regular intervals as follows:
 - 1. Sealed valves - weekly.
 - 2. Locked valves and valves with tamper switches - monthly.
 - 3. Verify that each control valve has the proper signage indicating what system or portion of system it controls - monthly.

4. Fully close and reopen the control valve - annually.
 5. Annually, lubricate the operating stems of OS&Y valves with graphite or graphite in light oil. Then completely close and reopen the valve to test its operation and distribution of the lubricant.
 6. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.
- G. Check valves - Internally inspect all check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
- H. Backflow preventers - Inspect and maintain specialized backflow prevention devices, such as reduced pressure principle backflow preventers, double check valve assemblies, backflow preventers with intermediate atmospheric vents, and atmospheric vacuum breakers, in accordance with the manufacturer's instructions. Also, inspect reduced pressure backflow preventers weekly to ensure that the differential sensing valve relief port is not continuously discharging.
- I. Fire pump pressure relief valves
1. Inspect all circulation relief valves weekly. The inspection shall verify that sufficient water flows through the valve when the pump is operating at shutoff pressure (churn) to prevent pump overheating. During the annual fire pump test, verify that this valve closes in accordance with the manufacturer's specifications.
 2. Inspect all pressure relief valves weekly. The inspection shall verify that the pressure downstream of the relief valve fittings in the fire pump discharge piping does not exceed the pressure for which the system components are rated. During the annual fire pump flow test, verify that this valve is correctly adjusted and set to relieve at the appropriate pressure and closes below that pressure setting.

4.0 TESTING

- A. Perform a fire pump running test weekly by reducing the water pressure. Do this with a test drain on the sensing line or with flow from the fire protection system. Qualified operating personnel should attend during the weekly pump operation to observe and record satisfactory performance of the pump driver, controller, and alarms.
- B. Test packing gland tightness weekly.

- C. Weekly, check to see that the suction and discharge pressure gauges are operable and that readings are appropriate.
- D. Check the steam trap on steam turbines weekly.
- E. Operate the speed governor for internal combustion drivers weekly.
- F. Operate the overspeed trip for internal combustion drivers weekly.
- G. Check the steam relief valve on steam turbines weekly.
- H. Check the controller timer weekly.
- I. Conduct a performance test annually. Water outlets on the test header, flow meter, or elsewhere in the discharge piping and hose network must be opened so that water is discharged at various flows. The test consists of determining that the pump will perform to discharge at no flow (churn), and 100% and 150% of rated flow. The water pressure gauges on the intake and discharge sides of the pump must be observed with readings recorded and pitot readings made at the discharge nozzle(s). These tests are repeated and recorded for all required flows. Results are plotted and compared to the manufacturer's pump test curve, past pump history, and the required flow.
- J. During the annual performance test, check all valves in the suction and discharge lines to make sure that they are fully open. Verify the setting of the pressure relief valve, if installed, by actual flow test. The setting should be correctly adjusted and set to relieve at the appropriate pressure.
- K. Report any significant reduction (10% net flow or pressure) in the operating characteristics of fire pump assembly to the AHJ and immediately start repairs.
- L. Test supervisory signals semi annually.
- M. Clean, inspect, and repair strainers as necessary after each performance test.
- N. Verify correct valve positions before and after each performance test.

5.0 MAINTENANCE

- A. Repair work and replacement parts must meet the original design criteria.
- B. Perform maintenance promptly on any components that fail a test or inspection. Use the manufacturer's instructions and the data sheet included below:

Table 143-1. Fire Pump System Maintenance Schedule.
(sheet 1 of 3)

Complete as Applicable	1	2	3	4	5	6
A. Hydraulic System						
Lubricate pump bearings			X			A
Check shaft end play and adjust if necessary		X				A
Check accuracy of pressure sensor			X			When 15% out of calibration
B. Mechanical Transmission						
Lubricate coupling		X				A
Lubricate right-angle gear drive		X				A
C. Electrical System						
Exercise isolating switch and circuit breaker					X	M
Trip circuit breaker (if mechanism provided)					X	A
Operate manual starting means (electrical)					X	S
Inspect and operate emergency manual starting means (without power)	X				X	A
Tighten electrical connections as necessary		X				A
Lubricate mechanical moving parts (excluding starters and relays)		X				A
Calibrate pressure switch settings		X				A
Grease motor bearings			X			A

Table 143-1. Fire Pump System Maintenance Schedule.
(sheet 2 of 3)

	1	2	3	4	5	6
D. Diesel Engine System						
1. Fuel						
Tank level	X	X				W
Tank float switch	X				X	W
Solenoids valve operation	X				X	W
Strainer, filter, and/or dirt leg				X		Q
Water in system		X		X		W
Flexible hoses and connectors	X		R			W
Tank vents and overflow piping unobstructed		X			X	A
Piping	X					A
2. Lubrication System - Oil level	X	X				W
Oil change			R			50? or A
Oil filter(s)			X			50? or A
Lube oil heater		X				W
Crankcase breather	X		R	X		Q
3. Cooling System - Level	X	X				W
Antifreeze protection level					X	S
Antifreeze			X			A
Adequate cooling water to heat exchanger		X				W
Rod out heat exchanger				X		A
Water pump(s)	X					W
Condition of flexible hoses and connections	X	X				W
Jacket water heater		X				W
Inspect duct work, clean louvers (combustion air)	X	X	X			A

Table 143-1. Fire Pump System Maintenance Schedule.
(sheet 3 of 3)

	1	2	3	4	5	6
4. Exhaust System - Leakage	X	X				W
Drain condensate trap		X				W
Insulation and fire hazards	X					Q
Excessive back pressure					X	A
Exhaust system hangers and supports	X					A
Flexible exhaust section	X					S
5. Battery System - Electrolyte Level		X				W
Terminals clean and tight	X	X				Q
Remove corrosion, case exterior clean and dry	X			X		M
Specific gravity or state charge					X	M
Charger and charge rate	X					M
Equalize charge		X				M
6. Electrical System - General Inspection	X					W
Tighten control and power wiring connections		X				A
Wire chafing where subject to movement	X	X				Q
Operation of safeties and alarms		X			X	S
Boxes, panels, and cabinets				X		S
Circuit breaker fuses (every 2 years or ??)	X	X	R	X	X	M

1. Visual Inspection
2. Check
3. Change
4. Clean
5. Test

6. Frequency
- W - Weekly
- M - Monthly
- Q - Quarterly
- S - Semi annually
- # - Indicates operating hours
- R - Change or repair

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Post a tag at each control valve indicating what system or part thereof has been removed from service.
- B. Stop all hazardous operations or
- C. Start a recorded fire watch within 1 hour of the outage if automatic systems are supplied by the pump, or
- D. Provide an alternate means of water supply to protect the hazardous operations.
- E. Begin repair operations within 8 hours, and the AHJ shall determine if B, C, and D shall be required until repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Conduct a performance test before returning to service to verify that an adequate volume and pressure of water is available.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 20
- D. NFPA 25

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1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining the fire service mains.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

A. Exposed piping - Visually inspect quarterly to verify the following:

- 1. There is no leakage
- 2. There is no physical damage to the piping or supports
- 3. There is no sign of corrosion
- 4. Supporting devices are securely in place.

B. Hydrants

- 1. Inspect dry barrel and wall hydrants semiannually and after each operation. Hydrants shall be inspected and the necessary corrective action taken as follows.

Table 144-1. Dry Barrel Hydrant Inspection.

Characteristic	Dry Barrel Hydrant Action
1. Accessibility.	1. Make accessible.
2. Barrel contains water or ice (Presence of water or ice may indicate a faulty drain, a leaky hydrant valve, or high groundwater table).	2. Repair and drain. For high groundwater, it may be necessary to plug the drain and pump out the barrel after each use.
3. Improper drainage from barrel.	3. Repair drain.
4. Leaks in outlets or at top of hydrant.	4. Repair or replace gaskets, packing, or parts as necessary.
5. Cracks in hydrant barrel.	5. Repair or replace.
6. Tightness of outlets.	6. Lubricate if necessary; tighten if necessary.
7. Worn nozzle threads.	7. Repair or replace if worn.
8. Worn hydrant operating nut.	8. Repair or replace.
9. Availability of operating wrench.	9. Make sure wrench is available.

2. Inspect wet barrel hydrants annually and after each operation. Inspect hydrants and take the necessary corrective action as follows.

Table 144-2. Wet Barrel Hydrant Inspection.	
Characteristic	Wet Barrel Hydrant Action
1. Accessibility	1. Make accessible.
2. Leaks in outlets or at top of hydrant.	2. Repair or replace gaskets, packing, or parts as necessary.
3. Cracks in hydrant barrel.	3. Repair or replace.
4. Tightness of outlets.	4. Lubricate if necessary; tighten if necessary.
5. Worn nozzle threads.	5. Repair or replace.
6. Worn hydrant operating nut.	6. Repair or replace.
7. Availability of operating wrench.	7. Make sure wrench is available.

- C. Inspect monitor nozzles semi annually. Check for the following conditions and take the necessary corrective action as appropriate:
 1. Accessibility - make accessible
 2. Physical damage - repair or replace
 3. Missing equipment - replace equipment.
- D. Inspect hose and hydrant houses monthly. Check for the following conditions and take the necessary corrective action as appropriate:
 1. Accessibility - make accessible
 2. Physical damage - repair or replace
 3. Missing equipment - replace equipment.
- E. Inspect FDCs monthly to verify that:
 1. The FDCs are visible and accessible.
 2. Couplings or swivels are not damaged and rotate smoothly.
 3. Plugs or caps are in place and not damaged. If FDC plugs or caps are not in place, inspect the interior of the connection for obstructions and verify that the valve clapper is

operational over its full range.

4. Gaskets are in place and in good condition.
 5. Identification signs are in place.
 6. The check valve is not leaking.
 7. The automatic drain valve is in place and operating properly.
- F. Visually inspect isolation or sectional valves at regular intervals as follows:
1. Sealed valves - weekly.
 2. Locked valves and valves with tamper switches - monthly.
 3. Verify that each control valve has the proper signage indicating what system or portion of the system it controls - monthly.
 4. Fully close and reopen control valves - annually.
 5. Lubricate the operating stems of OS&Y valves with graphite or graphite in light oil. Then completely close and reopen the valve to test its operation and distribution of the lubricant - annually.
 6. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.
- G. Internally inspect check valves at least every 5 years to verify that all components operate properly, move freely, and are in good condition. Clean, repair, or replace the internal components as necessary in accordance with the manufacturer's instructions.
- H. Backflow preventers - Inspect and maintain specialized backflow prevention devices, such as reduced pressure principle backflow preventers, double check valve assemblies, backflow preventers with intermediate atmospheric vents, and atmospheric vacuum breakers, in accordance with the manufacturer's instructions. Inspect reduced pressure backflow preventers weekly to ensure that the differential sensing valve relief port is not continuously discharging.

4.0 TESTING

- A. Test underground and exposed piping to determine the internal condition of the piping at minimum 5-year intervals. Perform flow tests at flows representative of those expected during a fire for the purpose of comparing friction loss characteristics of the pipe with that expected for the particular type of pipe involved. Give due consideration to the age of the pipe and to the results of previous flow tests.

Investigate any flow test results that indicate deterioration of available water flow and pressure to the satisfaction of the AHJ to ensure that adequate flow and pressure are available for fire protection.

- B. Flush test initial and any repaired systems. The minimum rate of flow must not be less than the water demand rate of the system, which is determined by the system design, or not less than that necessary to provide a velocity of 10 ft/s, whichever is greater. For all systems, continue the flushing operations for a sufficient time to ensure thorough cleaning. When planning the flushing operations, give consideration to disposal of the water issuing from the test outlets.
- C. At 5-year intervals, hydrostatically test private fire service mains, subject to supplemental pressure from a FDC, for 1 hour at a pressure of 150 psi.
- D. Operate hydrants annually to ensure proper functioning. Fully open each hydrant and let the water flow (1 to 2-1/2-in. outlet) until all foreign material has cleared; not less than 1 minute.

After operation, observe dry barrel and wall hydrants for proper drainage from the barrel. Full drainage shall take no longer than 60 minutes. When soil conditions or other factors are such that the hydrant barrel will not drain within 60 minutes, or when the groundwater level is above that of the hydrant drain, pump the water out of the barrel. In areas subject to freezing weather, clearly identify which dry barrel hydrants that have plugged drains need to be pumped out after operation.

- E. Test monitor nozzles that are mounted on hydrants as described above. To ensure proper operability, annually move and oscillate all monitor nozzles throughout their full range.
- F. Test all housed fire hydrant hose in accordance with NFPA 1962.

5.0 MAINTENANCE

- A. Maintain all equipment in proper working condition, consistent with manufacturer's recommendations.

B. Hydrants

1. Lubricate hydrants at least annually to ensure that all stems, caps, plugs, and threads are in proper operating condition.
 2. Keep hydrants free of snow, ice, or other materials and free from physical damage so that free access is ensured.
- C. Lubricate monitor nozzles at least annually to ensure proper operating condition.
- D. Maintain hose and hydrant houses in a continuous condition that ensures all fire hose and required components are in usable condition.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following:

- A. Post a tag at each FDC and system control valve indicating what system or part thereof has been removed from service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage if the system supplies automatic sprinkler systems, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 8 hours. The AHJ shall decide if B, C, and D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the water supply to verify that an adequate pressure and volume of water is available.
- B. Hydrostatically test the system per 4. A, under 4.0, "Testing," before returning the system to service.
- C. Conduct a flow test per paragraph 4. B before returning the system to service.

- D. Flush test any repaired system per paragraph 4. B before returning the system to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480. 4
- B. DOE Order 5480. 7A
- C. NFPA 24
- D. NFPA 25

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151 - FIRE ALARM SYSTEM

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining the fire alarm and detection systems.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Inspect the entire system semiannually to verify that each device is in good physical condition and that there are no changes that could affect its performance.

4.0 TESTING

- A. Test the control panel monthly in accordance with manufacturer's recommendations.
- B. Verify bimonthly that each fire sprinkler alarm initiation device signal is transmitted.
- C. Verify semiannually that each supervisory initiation device signal is transmitted.
- D. Test each manual fire alarm station initiation device semiannually to verify that the signal is transmitted.
- E. Test all pneumatic line-type detectors for leaks and proper operation semiannually.
- F. Every 5 years, test each fire (restorable heat) detection device.

- G. Using a calibrated light source, test each fire (radiant energy type) detection device on a semiannual basis. If outside this design range, recalibrate or replace the unit.
- H. Annually test each fire (smoke) detection device to verify proper operation of the detector and transmission of the alarm.
- I. On a semiannual basis, test each fire, gas, or other detector.
- J. Check the sensitivity of each smoke detector within 1 year of installation and every 2 years thereafter. Sensitivity testing must be in accordance with manufacturer's instructions and use manufacturer-approved equipment. Clean smoke detectors found outside 0.25% per foot obscuration per manufacturer's recommendations and recheck for correct sensitivity before reinstallation.
- K. Check each duct type smoke detector annually to verify that it is properly sampling the air stream.
- L. Check each audible or visual alarm indicating appliance on an annual basis to verify that the alarm can be heard and/or seen in all required locations. Record and evaluate audible alarming sound pressure levels to determine if the level can be adequately heard by all occupants.
- M. Check each remote annunciator, emergency voice, and/or two-way alarm communication system on an annual basis to verify each is operating according to system requirements.
- N. Operate each engine-driven generator dedicated to the signaling system each week under load by disconnecting the normal power to the system and operating it under load for at least 30 minutes, continuous.
- O. Annually operate each system battery supply under load by disconnecting the normal power to the system and operating it under supervisory load for 4 hours and full load for 5 minutes, continuous.
- P. Replace 2% of the nonrestorable heat detectors after 15 years and 2% every year thereafter. Submit the removed detectors to an approved testing laboratory for verification. If the detectors fail in the laboratory, remove and replace an additional 2%.

5.0 MAINTENANCE

- A. Repair or replace any device that fails a test or inspection in accordance with the manufacturer's instructions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag at the fire alarm control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 24 hours or B or C or D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the fire detection devices to verify that they are operating properly.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 72
- D. NFPA 72E

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1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining the central monitoring (fire) system.

2.0 PROCEDURE

A. Preplanning

1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. None required.

4.0 TESTING

- A. Test the control panel weekly in accordance with manufacturer's recommendations.
- B. Check each audible and visual alarm supervisory-indicating appliance on an annual basis to verify that the alarm can be heard and/or seen in all required locations. Record and evaluate audible alarming sound pressure levels to determine if the level is adequate to be heard by all occupants.
- C. Check each printer, off-premises alarm, remote terminal, emergency voice, and/or two-way alarm communication system on an monthly basis to verify each is operating according to system requirements.
- D. Operate each engine-driven generator dedicated to the signaling system each week under load by disconnecting the normal power to the system and operating it under load for at least 30 minutes, continuous.

- E. Operate each system battery supply annually under load by disconnecting the normal power to the system and operating it under supervisory load for 4 hours and full load for 10 minutes, continuous.

5.0 MAINTENANCE

- A. Repair or replace any component that fails a test or inspection in accordance with the manufacturer's instructions.

6.0 CORRECTIVE ACTION

6.1 Impairment

If one or more of the commitments is not maintained, notify facility management, the Fire Department, and other appropriate AHJs and complete the following.

- A. Place a tag at the control panel indicating what portion of the system is out of service.
- B. Stop all hazardous operations, or
- C. Start a recorded fire watch within 1 hour of the outage, or
- D. Provide an alternate means to protect the hazardous operations.
- E. Begin repair operations within 24 hours or B or C or D shall be required until the repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Test the fire alarm subsystem devices to verify that an alarm or supervisory signal can be received and recorded.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 71
- D. NFPA 72
- E. NFPA 72E

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161 - FIRE DOORS AND WINDOWS

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining fire doors and fire windows.

2.0 PROCEDURE

- A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
 - 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

- B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Conduct a monthly inspection to verify that fire doors and windows are not blocked open, releasing devices are operable, and that latching mechanisms are functioning properly.

4.0 TESTING

- A. Annually test closing mechanisms.

5.0 MAINTENANCE

- A. Correct any deficiencies in accordance with the manufacturer's instructions.

6.0 CORRECTIVE ACTION

6.1 Impairment

Notify facility management and other appropriate AHJs and complete the following.

- A. Post a sign at the fire door or window indicating that door and opening protection are not in service. The AHJ shall specify the size and location of the sign.
- B. Stop all hazardous operations, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ shall decide if B and/or C shall be required until repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Conduct a full operation test after completing any repairs.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 80

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining fire dampers.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Conduct a semiannual inspection to verify that fire dampers are not blocked open, releasing devices are operable, and that latching mechanisms are functioning properly.

4.0 TESTING

- A. Annually test closing mechanisms.

5.0 MAINTENANCE

- A. Correct any deficiencies in accordance with the manufacturer's instructions.

6.0 CORRECTIVE ACTION

6.1 Impairment

Notify facility management and other appropriate AHJs and complete the following.

- A. Post a sign at the fire damper indicating that duct protection is not in service. The AHJ shall specify the size and location of the sign.
- B. Stop all hazardous operations, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ shall decide if B and/or C shall be required until repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Conduct a full operation test after completing any repairs.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 90A

163 - PENETRATIONS IN FIRE WALLS

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining wall penetrations - fire rated.

2.0 PROCEDURE

A. Preplanning

- 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
- 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

B. Reduced testing frequency

- 1. The required frequency of testing can be reduced if it can be proven that the system's reliability is significantly better than the minimums established by NFPA and this procedure. Submit written records and proof of reliability for review and acceptance by the AHJ.

3.0 INSPECTION

- A. Conduct a monthly visual inspection to verify that the fire barrier is not breached.

4.0 TESTING

- A. No destructive testing required.

5.0 MAINTENANCE

- A. Repair any deficiencies in accordance with the manufacturer's instructions.

6.0 CORRECTIVE ACTION

6.1 Impairment

Notify facility management and other appropriate AHJs and complete the following.

- A. Post a sign at the penetration indicating that penetration protection is not in service. The AHJ shall specify the size and location of the sign.
- B. Stop all hazardous operations, or
- C. Provide an alternate means to protect the hazardous operations.
- D. Begin repair operations within 24 hours. The AHJ shall decide if B and/or C shall be required until repairs are complete.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. None required.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A

171 - EMERGENCY AND EXIT ILLUMINATION

1.0 PURPOSE

- A. This procedure outlines the requirements for inspecting, testing, and maintaining emergency lights and exit illumination.

2.0 PROCEDURE

- A. Preplanning
 - 1. Before starting this procedure, notify the Fire Department, management, and the AHJs.
 - 2. Arrange with operations for the time needed to conduct the inspection, testing, and maintenance of the protected area.

3.0 INSPECTION

- A. Visually inspect each fixture on a monthly basis to verify that it is operational and aimed correctly. The light should illuminate for a minimum of 30 seconds.
- B. Visually inspect the emergency power supply systems (EPSS) weekly.
- C. Inspect the stored electric energy emergency and standby power systems (SEPSS) every month. The inspection shall include the following.
 - 1. Check that the battery and associated charger and control equipment are in a clean and satisfactory condition. Also, check that no exceptional environment or other condition exists that could damage or affect performance.
 - 2. Check battery electrolyte levels, where applicable, and refill as necessary. Clean and regrease terminals and intercell connectors, if necessary, and clean cell tops.
 - 3. Check and record individual cell voltages where practical.
 - 4. Check and record specific gravity of pilot cells, where applicable.
 - 5. For free-electrolyte lead acid batteries in transparent containers, note condition of plates and sediment.
 - 6. Perform load test and record at the beginning and end of test for each battery set: output voltage, battery voltage, and test duration.

7. Check that all indicator lamps, meters, and controls are operating correctly.
8. Check load value to ensure that it is within the equipment rating.

4.0 TESTING

- A. Annually, each fixture should be load tested for 90 minutes to determine if the battery is carrying an adequate electrical charge.

- B. EPSS

1. Exercise generator sets under operating temperature conditions, and at a capacity not less than 50% of the total connected EPSS load (not less than 30% of EPS nameplate rating and preferably at least 50% of EPS nameplate rating), at least monthly for a minimum of 30 minutes.
2. Automatically replace equivalent loads used for testing with the emergency loads in case of failure of the primary source.
3. Include complete cold starts with load tests of generator sets.
4. Set time delays as follows.
 - a. Time delay on start: Minimum 1 second (.5 seconds for gas turbine cycle).
 - b. Time delay on transfer to emergency: No minimum required.
 - c. Time delay on restoration to normal: 5 minutes minimum.
 - d. Time delay on shutdown: 5 minute minimum.
5. Test the transfer switch monthly by electrically operating it from normal position to alternate position and returning it to normal.
6. Annually exercise EPSS circuit breakers for Level 1 usage, including main and feed breakers between the EPSS and the transfer switch load terminals.

Exception: Exercise medium and high voltage circuit breakers every 6 months and test them under simulated overload conditions every 2 years.

- C. SEPSS

1. Exercise equipment at least quarterly under connected load for a minimum of 5 minutes.

2. Once per year, check the SEPSS at full load for the full duration for its class.

5.0 MAINTENANCE

- A. Annually, each fixture should be cleaned, realigned if necessary, and the battery connections checked.
- B. Conduct routine maintenance, and that deemed necessary by inspections, in accordance with the manufacturer's instructions for EPSS and SEPSS equipment.

6.0 CORRECTIVE ACTION

6.1 Impairment

Notify facility management and other appropriate AHJs and complete the following:

- A. Evacuate all occupants.
- B. Begin repair operations within 24 hours. The AHJ shall decide if A is necessary.

6.2 Inspection

- A. Visually inspect the system before returning to service.

6.3 Testing

- A. Operation test each fixture when a unit is returned to service.

7.0 RECORDS

Maintain records showing the system design and all inspection and testing for the life of the facility.

8.0 REFERENCES

- A. DOE Order 5480.4
- B. DOE Order 5480.7A
- C. NFPA 101
- D. NFPA 110
- E. NFPA 110A

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DATA SHEET 111
WET PIPE SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

VALVES	MAKE	MODEL	SIZE	SUPERVISION
Control				
Check				
Alarm				
FDC				

SYSTEM DESIGN:

Pipe Schedule _____ Hydraulic _____ gpm ft²

Hose Allowance _____ Water Demand: _____ gpm @ _____ psi

Location _____

Building Modification Since Design? Yes _____ No _____

Design Water Supply: Static _____ psi Residual _____ psi

Flow _____ gpm Location and Elevation _____

Fire Pump: Yes _____ No _____

NOTES:

DATA SHEET 111

WET PIPE SYSTEM TESTING

DATE: CONDUCTED BY:			
Control Valve Cycled			
Static Water Pressure			
Main Drain Connection			
Residual Water Pressure			
Building Heated Adequately			
Inspector's Test			
Local Alarm			
Water Flow Alarm			
Relocked or Seals Replaced			
Antifreeze Freeze Level			
Supervisory Signals			

NOTES:

DATA SHEET 112

DRY PIPE SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

VALVES	MAKE	MODEL	SIZE	SUPERVISION
Control				
Check				
FDC				
Dry Pipe				

SYSTEM DESIGN:

Pipe Schedule _____ Hydraulic _____ gpm ft²

Hose Allowance _____ Water Demand: _____ gpm @ _____ psi

Location _____

Building Modification Since Design? Yes _____ No _____

Design Water Supply: Static _____ psi Residual _____ psi

Flow _____ gpm Location and Elevation _____

Fire Pump: Yes _____ No _____

NOTES:

DATA SHEET 112

DRY PIPE SYSTEM TESTING

DATE: CONDUCTED BY:			
Control Valve Cycled			
Static Water Pressure			
Main Drain Connection			
Residual Water Pressure			
Dry Pipe Priming Level			
Trip Test			
Time to Trip			
Air Pressure Trip Point			
Water Flow Alarm			
Local Alarm			
Relocked or Seals Replaced			
Supervisory Signals			
Air Pressure Controller			
System Drained			

NOTES:

DATA SHEET 113

DELUGE SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

VALVES	MAKE	MODEL	SIZE	SUPERVISION
Control				
Check				
Deluge				

SYSTEM DESIGN:

Pipe Schedule _____ Hydraulic _____ gpm ft²

Hose Allowance _____ Water Demand: _____ gpm @ _____ psi

Location _____

Actuation System: HAD _____ Smoke Detectors _____

Linear Beam Detectors _____ Thermal Detectors _____

Building Modification Since Design? Yes _____ No _____

Design Water Supply: Static _____ psi Residual _____ psi

Flow _____ gpm Location and Elevation _____

Fire Pump: Yes _____ No _____

NOTES:

DATA SHEET 113

DELUGE SYSTEM TESTING

DATE: CONDUCTED BY:			
Control Valve Cycled			
Static Water Pressure			
Main Drain Connection			
Residual Water Pressure			
Trip Test			
Time to Trip			
Water Flow Alarm			
Local Alarm			
Discharge Patterns			
Duration of Discharge			
Supervisory Signals			
Relocked or Seals Replaced			
System Drained			
Manual Activation Devices			
Automatic Detection Devices			
Battery Backup			

NOTES:

DATA SHEET 114

PRE- ACTION SYSTEMS TESTING

SYSTEM LOCATION: _____ YEAR: _____

VALVES	MAKE	MODEL	SIZE	SUPERVISION
Control				
Check				
Deluge				

SYSTEM DESIGN:

Pipe Schedule _____ Hydraulic _____ gpm ft²

Hose Allowance _____ Water Demand: _____ gpm @ _____ psi

Location _____

Actuation System: HAD _____ Smoke Detectors _____

Linear Beam Detectors _____ Thermal Detectors _____

Building Modification Since Design? Yes _____ No _____

Design Water Supply: Static _____ psi Residual _____ psi

Flow _____ gpm Location and Elevation _____

Fire Pump: Yes _____ No _____

NOTES:

DATA SHEET 114

PRE- ACTION SYSTEMS TESTING

DATE: CONDUCTED BY:			
Control Valve Cycled			
Static Water Pressure			
Main Drain Connection			
Residual Water Pressure			
Deluge Valve Priming Level			
Trip Test			
Time to Trip			
Water Flow Alarm			
Local Alarm			
Air Pressure Trip Point			
Relocked or Seals Replaced			
Manual Activation Devices			
Supervisory Signals			
System Drained			
Automatic Detection Devices			
Battery Backup			

NOTES:

DATA SHEET 116

FOAM WATER EXTINGUISHING SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

VALVES	MAKE	MODEL	SIZE	SUPERVISION
Control				
Check				
Deluge				

SYSTEM DESIGN:

Pipe Schedule _____ Hydraulic _____ gpm ft²

Hose Allowance _____ Water Demand: _____ gpm @ _____ psi

Location _____

Actuation System: HAD _____ Smoke Detectors _____

Linear Beam Detectors _____ Thermal Detectors _____

Building Modification Since Design? Yes _____ No _____

Design Water Supply: Static _____ psi Residual _____ psi

Flow _____ gpm Location and Elevation _____

Foam: Type _____ Concentration _____

Proportioner Type _____

Fire Pump: Yes _____ No _____

NOTES:

DATA SHEET 116

FOAM WATER EXTINGUISHING SYSTEM TESTING

DATE: CONDUCTED BY:			
Control Valve Cycled			
Static Water Pressure			
Main Drain Residual			
Operation Performance Test			
Detection Response Time			
Discharge Time			
Discharge Patterns			
Foam Concentration			
Remote Head Pressure Reading			
Residual Water Pressure			
Deluge Valve Trip Time			
Water Flow Alarm			
Local Alarm			
Relocked or Seals Replaced			
Manual Activation Devices			
Automatic Detection Devices			
Supervisory Signals			
Battery Backup			

NOTES:

DATA SHEET 121

WET STANDPIPE SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

VALVES	MAKE	MODEL	SIZE	SUPERVISION
Control				
Check				
Alarm				
Pressure Relief				

SYSTEM DESIGN:

Classification: I _____ II _____ III _____

Hose Valves _____ Hose Cabinet Assemblies

Water Demand: _____ gpm @ _____ psi

Location _____

Building Modification Since Design? Yes _____ No _____

Design Water Supply: Static _____ psi Residual _____ psi

Flow _____ gpm Location and Elevation _____

Fire Pump: Yes _____ No _____

NOTES:

DATA SHEET 121**WET STANDPIPE SYSTEM TESTING**

Use standard Hydrostatic Test Form in NFPA 13 for initial hydrostatic tests and 5-year tests on dry portions of wet standpipes.

DATA SHEET 122

DRY STANDPIPE SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

VALVES	MAKE	MODEL	SIZE	SUPERVISION
Control				
Check				
Deluge				
Dry Pipe				
Pressure Relief				

SYSTEM DESIGN:

Classification: I _____ II _____ III _____

Hose Valves _____ Hose Cabinet Assemblies

Water Demand: _____ gpm @ _____ psi

Location _____

Building Modification Since Design? Yes _____ No _____

Design Water Supply: Static _____ psi Residual _____ psi

Flow _____ gpm Location and Elevation _____

NOTES:

DATA SHEET 122**DRY STANDPIPE SYSTEM TESTING**

Use standard Hydrostatic Test Form in NFPA 13 for 5-year hydrostatic tests.

DATA SHEET 131

HALON 1301 SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

Room or Area Designation _____

Volume Protected: Above Ceiling _____ Below Raised Floor _____

Between Floor and Ceiling _____

System Manufacturer: _____ System Concentration _____

Weight of Halon Agent with Cylinder _____

Weight of Cylinder (tare) _____

Weight of Halon Agent _____

Normal Pressure _____ psi

Detector Manufacturer _____

Control Panel _____

Detection System: Ion. _____ Photo. _____ ROR _____

FT _____ ROR/FT _____ Inhibit Switch _____

Type of Detection for System Operation:

Single Zone _____ Two Detectors (Cross-Zoned) _____

Two Detectors on Any Zone _____ Other _____

Equipment Interlocks:

HVAC _____ Damper Close _____ Door/Window Release _____

NOTES:

DATA SHEET 131

HALON 1301 SYSTEM TESTING

DATE: CONDUCTED BY:			
Weight of Halon with Cylinder			
Weight of Cylinder			
Weight of Halon Agent			
Activation Control Device Operation			
Operation Test			
Detectors			
Time to Discharge			
Equipment Interlocks			
Local Alarm			
Audible Alarm			
Visual Alarm			
Central Alarm			
Manual Activation Devices			
Battery Backup			

NOTES:

DATA SHEET 132

HALON 1211 SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

Room or Area Designation _____

Volume Protected: Above Ceiling _____ Below Raised Floor _____

Between Floor and Ceiling _____

System Manufacturer: _____ System Concentration _____

Weight of Halon Agent with Cylinder _____

Weight of Cylinder (tare) _____

Weight of Halon Agent _____

Normal Pressure _____ psi

Detector Manufacturer _____

Control Panel _____

Detection System: Ion. _____ Photo. _____ ROR _____

FT _____ ROR/FT _____ Inhibit Switch _____

Type of Detection for System Operation:

Single Zone _____ Two Detectors (Cross-Zoned) _____

Two Detectors on Any Zone _____ Other _____

Equipment Interlocks:

HVAC _____ Damper Close _____ Door/Window Release _____

NOTES:

DATA SHEET 132

HALON 1211 SYSTEM TESTING

DATE: CONDUCTED BY:			
Weight of Halon with Cylinder			
Weight of Cylinder			
Weight of Halon Agent			
Activation Control Device Operation			
Operation Test			
Detectors			
Time to Discharge			
Equipment Interlocks			
Local Alarm			
Audible Alarm			
Visual Alarm			
Central Alarm			
Manual Activation Devices			
Battery Backup			

NOTES:

DATA SHEET 137

HIGH PRESSURE CO₂ EXTINGUISHING SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

Room or Area Designation _____

Volume Protected: Above Ceiling _____ Below Raised Floor _____

Between Floor and Ceiling _____

System Manufacturer: _____ System Concentration _____

Weight of CO₂ Agent with Cylinder _____

Weight of Cylinder (tare) _____

Weight of CO₂ Agent _____

Normal Pressure _____ psi

Detector Manufacturer _____

Control Panel _____

Detection System: Ion. _____ Photo. _____ ROR _____

FT _____ ROR/FT _____ Inhibit Switch _____

Type of Detection for System Operation:

Single Zone _____ Two Detectors (Cross-Zoned) _____

Two Detectors on Any Zone _____ Other _____

Equipment Interlocks:

HVAC _____ Damper Close _____ Door/Window Release _____

NOTES:

DATA SHEET 137

HIGH PRESSURE CO₂ EXTINGUISHING SYSTEM TESTING

DATE: CONDUCTED BY:			
Weight of CO ₂ Container			
Activation Control Device Operation			
Operation Test			
Detectors			
Time to Discharge			
Equipment Interlocks			
Local Alarm			
Audible Alarm			
Visual Alarm			
Central Alarm			
Manual Activation Devices			
Battery Backup			

NOTES:

DATA SHEET 138

LOW PRESSURE CO₂ EXTINGUISHING SYSTEM TESTING

SYSTEM LOCATION: _____ YEAR: _____

Room or Area Designation _____

Volume Protected: Above Ceiling _____ Below Raised Floor _____

Between Floor and Ceiling _____

System Manufacturer: _____ System Concentration _____

Weight of CO₂ Agent with Cylinder _____

Weight of Cylinder (tare) _____

Weight of CO₂ Agent _____

Normal Pressure _____ psi

Detector Manufacturer _____

Control Panel _____

Detection System: Ion. _____ Photo. _____ ROR _____

FT _____ ROR/FT _____ Inhibit Switch _____

Type of Detection for System Operation:

Single Zone _____ Two Detectors (Cross-Zoned) _____

Two Detectors on Any Zone _____ Other _____

Equipment Interlocks:

HVAC _____ Damper Close _____ Door/Window Release _____

NOTES:

DATA SHEET 138

LOW PRESSURE CO₂ EXTINGUISHING SYSTEM TESTING

DATE: CONDUCTED BY:			
Weight of CO ₂ Container			
Activation Control Device Operation			
Operation Test			
Detectors			
Time to Discharge			
Equipment Interlocks			
Local Alarm			
Audible Alarm			
Visual Alarm			
Central Alarm			
Manual Activation Devices			
Battery Backup			

NOTES:

**DATA SHEET 143
FIRE PUMP TESTING**

PUMP	Locati on (Area- Bui ldi ng- Pump Number)				
	Make		Rated Capacity - gpm		
	Model, Type		Rated Head - psi		
	Serial No.		Rated Speed - rpm		
DRI VER	Driver (Make- Model)				
	rpm	hp	Volts	Amps	Service Factor
SUCTION SUPPLY	From	Capacity - gal		Alarm at Low	
	Head or Lift, psi		Alarms - Low Level		
CONTROLLER	Make- Model		Type	UL Approved	
	Set to Start Pump at - psi			Cut out at - psi	
	After Delay - Min. or Manual Stop				
JOCKEY PUMP	Capacity gpm	Cuts in at - psi		Cuts out at - psi	
	Type				
ALARMS	Local		Pump Runni ng	Power Fai lure	
	Overspeed	Selector Sw. in Auto		Overcrank	
	Low Oi l Pressure		Hi gh Engi ne Temp		
POWER SUPPLY	Overhead- Underground- Li ghtni ng Protecti on				
	Transformer (No. - Locati on)				
OTHER					

DATA SHEET 143

FIRE PUMP TESTING

FIRE PUMP TEST REPORT											
Date Time	No. and Size of Nozzles	Pump Pressure			Pitot Press	gpm	rpm	Volt	Amps	Corrected to Rated rpm	
		Dis	Suc	Net						Net Head	gpm

NOTES:

DATA SHEET 151

FIRE ALARM SYSTEM TESTING

SYSTEM TYPE:

Local _____ Proprietary _____ Central _____ Auxiliary _____

System Location: _____

Control Panel: Make _____ Model _____

Addressable _____ Location _____

Initiating Circuit Style: _____

Indicating Circuit Style: _____

Signaling Circuit Style: _____

Supervisory Circuit Style: _____

Backup Power: Battery _____ hrs. Generator _____ hrs.

Off-premises Signaling: Direct Connection _____

Central Station _____ Auxiliary Street Box: _____

Telephone Line _____ DACT _____

Transmitted To: _____

Manual Fire Alarm Stations: Partial Coverage _____

Full Coverage _____ Coded _____ Noncoded _____

Automatic Fire Alarm Stations: Partial Coverage _____

Full Coverage _____ Ion _____ Photo. _____

Linear Beam _____ Flame _____ Other _____

FT _____ ROR _____ FT/ROR _____ DS _____

Waterflow Alarm Initiating Devices:

Location(s): _____

Type(s): _____

Other Initiating Signals (Halon, Hood, etc.) _____

DATA SHEET 151 (cont.)**Alarm Signaling Devices**

Bell _____ Horn _____ A/V _____ Speaker _____

Siren _____ Full Coverage _____ Partial Coverage _____

ADA _____

Voice Communication System:

Location of Panel: _____

Location of Speakers: _____

DATA SHEET 151

FIRE ALARM SYSTEM TESTING

Date: Conducted By:	Pass	Fail	N/A
Control Panel			
Manual Pull Stations			
Pneumatic Line-Type Detectors			
Fire (Restorable Heat) Detector			
Fire (Radiant Energy) Detector			
Fire (Smoke) Detector			
Other Fire Detectors			
Duct-Type Smoke Detector			
Waterflow Alarms			
Supervisory Devices			
Smoke Detector Sensitivity			
Alarm Indicating Appliances			
Remote Annunciator			
Emergency Voice			
Two-Way Alarm Communication			
Generators			
Battery			
Off-Premises Communication			

NOTES:

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